Ethics & Medicine

Human Embryos, Human Ingenuity, and Government Policy
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Introduction

New technologies have brought new moral dilemmas, as seen in the developing field of stem cell technology. The use of human embryonic stem cells in particular has become the subject of fierce debate, because deriving them from early embryos in the blastocyst stage (approximately 14 days old) implies that these embryos are destroyed. This has renewed the debate on the moral status of embryos and the respect that ought to be given to them (begging the question, can we respect what we destroy?).[1] In this debate ingenious moral arguments have been put forward to defend a difference in moral status between early embryos and embryos at later stages of development (or fetuses). Surveys of national review bodies are said to 'have consistently refused to find that embryos are themselves persons with intrinsic rights, and they have recommended that research be permitted with spare embryos when necessary for good medical or scientific purposes'.[2] Legislation in various countries tends to be based on such public policy. Implicit here is that respect to embryos is not necessarily shown by banning all research with embryos or aborted fetuses, but by discriminately allowing such research only when good reasons exist for engaging in it.

In The Netherlands a law was passed in Parliament which permits the use of supernumerary embryos for research and—in five years time—the use of embryos especially created for research.[3] A major assumption of the political coalition responsible for creating this law was that the moral respect owed to embryos intended for implantation in the uterus was greater than the respect owed to embryos intended for research. However, this law stipulates that research with embryos especially created for (stem cell) research can only be carried out under very strict conditions, suggesting a higher moral status of embryos created for research than for spare embryos. One would expect these embryos to be treated rather with lower moral status, because they are not even intended for implantation. A similar line of argument is presented, for example, by McGee and Caplan, who propose that the moral status of an embryo depends on the 'institutional context'. Embryos are seen to acquire different meaning when they are found outside their ordinary context (i.e., reproduction).[4]

Political parties who wish to uphold full protection of an embryo from its earliest beginnings face a dilemma, once the instrumental (therapeutic) use of embryos has been made possible by law. They can continue to reissue their arguments for full moral status. This may not be very fruitful in view of the social and political support, as in The Netherlands, for ascribing a lesser moral status to an embryo in the earliest developmental stages. Another possibility is to investigate how a common policy can be developed—together with other coalition partners—which does justice to the principle of full moral respect for embryos.

The Scientific Institute for Public Policy of the Christian Democratic Party in The Netherlands has chosen the second option in a recent report. It explores the major arguments for embryo research, concludes that these arguments are not sufficiently strong to change the party's position of full moral protection of the embryo, and investigates the possibilities for a common policy of maximal reduction of the number of embryos used for research. This paper presents the report's main arguments for adoption of such a policy.[5]

What Is an Embryo?

On the basis of what is now scientifically known about the beginning of human life it is justified to mark the process of fertilization as the beginning of new human life—a process which takes about 24 hours and begins with the penetration of the ovum by the sperm and ends with the creation of a new genome. Crucial in this process is the moment of recombination (fusion) of the genetic material of both gametes into a new and unique genome which starts a programmed gradual development towards the completion of becoming a new human individual.

An embryo can therefore be defined as a cell or group of cells which is totipotent and which—in its natural environment—has the potential to develop into a human individual. At present a new genome cannot only be created in the womb, but also in petri through various techniques. Creation of new human life through cell nuclear transfer is the most recent technique, where the genetic material in a cell nucleus is transferred to an egg from which the original nucleus has been removed. Through electrofusion a new cell is created which is totipotent and which, in an appropriate environment, has the potential to develop into a human individual. Such a cell falls within the definition given above and deserves the same protection as other embryos.

An important question for human embryonic stem cell research is at what stage of development the growing cluster of cells is not totipotent anymore. A totipotent cell can, in principle, be separated from this cluster and develop into any of the many different types of body cells. Also, when it is brought into the appropriate environment (uterus), it can develop into a new human individual. Totipotent cells can therefore also be regarded as embryos. They must be distinguished from pluripotent cells, however. These cells can still differentiate into many, but not all, types of body cells or tissue, and more importantly, they do not have the potential anymore to develop into a new human being.

In principle, it is possible to transform pluripotent embryonic stem cells into totipotent cells by fusion with a

blastocyst. But from this it does not follow that pluripotent cells have the moral status of totipotent stem cells. Pluripotent stem cells can best be compared with gametes. Only after fusion (or fertilization) has taken place can they develop into a new human being. That fusion is the crucial element, not the pluripotent status of a cell, is underscored by the very process of cell nuclear transfer. In principle every body cell can be used to transfer its nucleus to an egg for the creation of an embryo. This does not give these cells a special status, however. As every body cell can develop into a new embryo through this technique, it would be absurd to state that they should therefore possess special moral status.

When a cell is isolated from the developing embryo which is not totipotent anymore, it cannot be regarded as an embryo and can therefore be used for research purposes—if the separation does not lead to the destruction of the source. The present state of the art does not justify a definitive conclusion with regard to the moment the embryonic cells are not totipotent anymore. It is unknown whether an isolated cell from a human embryo at the eight-cell stage will develop into a new human being. It is assumed that in the eight-cell stage five cells are involved in the development of the trophoblast (the layer of cells in the embryo which will establish relation with the uterus) and three cells which will eventually develop into the embryo proper. This would imply that cells at the eight-cell stage are already differentiating and cannot be termed totipotent anymore, but until now there is no certainty about this. This uncertainty should therefore lead to great restraint in using these cells.

Embryos and Moral Ingenuity (1)

Moral ingenuity has assigned to some types of embryos a greater moral status (therefore deserving of more protection) than others. For example, a distinction has been made between 'spare' embryos, which remain 'unused' after fertility treatment, and embryos especially created for research purposes. Proponents of embryonic research point to the many embryos left over from an IVF procedure. They argue that from a moral point of view it is better to use these supernumerary embryos than to create embryos especially for research. At first sight this seems a reasonable approach, but this position can be rejected for a number of reasons.

(a) Improvements in fertility treatments will reduce the number of spare embryos and the number of embryos potentially 'available' for research will therefore become smaller. It is therefore reasonable to assume that use of spare embryos is only the first step, leading inevitably to the creation of embryos for research when the number of spare embryos is insufficient.

(b) It could be tempting to create a few extra embryos in an IVF procedure, which could then be used for research after the procedure is completed.

(c) If the creation of a new genome is taken as the starting point of a programmed development of an embryo into a human being (see above), a distinction in moral status between spare embryos and embryos created for research purposes cannot be defended. From this it follows that, once the use of spare embryos is accepted, it will be difficult to stop the creation of new embryos for research, precisely because there is no difference in moral status between spare embryos and embryos created for research.

(d) More importantly, the expectation is that the use of spare embryos will lead to a more general and societal decrease of respect for embryos. This expectation is felt to be real. In the past, acceptance of more inefficient IVF procedures implied permission to create a greater number of embryos than truly necessary. This led to a request to use the extra embryos for research purposes. Permission would imply further instrumental use of embryos. The next step now is to create embryos especially for research purposes. This process is clearly visible in the new Dutch Embryo Protection Act. It permits use of spare embryos (when certain conditions have been met), because there seems to be enough public and political support for it. In fact, it even speculates on a further shift in public opinion towards acceptance of the creation of embryos specifically for research within five years. This search for public support is not only found in The Netherlands. Also the NBAC states: 'We do not, at this time, support the federal sponsorship of research involving the creation of embryos solely for research purposes. However, we recognize that in the future, scientific research and public support for this kind of stem cell research may be sufficient in order to proceed'.[6]

(e) Another distinction in moral status is made between human embryos used for reproduction and embryos used for therapeutic reasons. The argument is that—when used for research purposes—these embryos do not have the potential to become human beings because they are not transferred to the uterus. This distinction in moral status can also be rejected. The crucial point is that the moral status of the embryo cannot depend on the intentions of the creators. An embryo created in the dish possesses a new genome and has the potential to become a new human being. It is an act of the human will that it is not placed into the appropriate environment (the uterus) and that this potential will not be fulfilled. Accepting a different moral status for research embryos would imply that the moral status of the embryo is dependent on the arbitrary intentions of the scientist. The implication of this position for spare embryos is that at the very moment an embryo is not selected for implantation its moral status changes. By analogy, can parents who are expecting a baby change the moral status of a developing embryo or fetus simply by wishing for or having an abortion? This position denies the intrinsic worth of all developing forms of human life. In a similar form of reasoning a difference in moral status is grounded on the probability that an embryo will develop into a new human being. This probability is greater if it is implanted in the uterus, and this embryo has therefore a higher moral status than an embryo which is not transferred. Obviously, here, too, the moral status is dependent on the intentions of the 'creator' to transfer the embryo to its natural environment or not.

(f) A distinction in moral status has also been based on different processes of creation. Embryos can be created by traditional fertilization techniques or by cell nuclear transfer. It is argued that embryos created by cell nuclear transfer are not intended to develop into a new human individual.[7] This argument not only disregards the various attempts to clone human beings, but is also based on the assumption that the intentions of the 'creator' are decisive for the moral status of the human embryo. The crucial moral moment is, however, the creation of a new

embryo, which in principle can become a new individual. It is man who decides what happens and in which kind of environment an embryo is placed. These arbitrary decisions cannot determine the moral status of the embryo.

(g) The 'appeal to nature' argument, put forth in support of the Embryo Protection Act, can also be rejected. The argument is that many embryos are lost in the uterus also. This apparently also justifies the destruction of embryos for research purposes. This argument is rejected because the oversight is that man is not morally responsible for natural processes in the womb. He is responsible, however, for the creation of embryos in the dish and their subsequent development as well as for their intentional destruction.

For our purposes it is noteworthy that both proponents and opponents do assign moral status to the embryo. 'Many parties to the debate, at least, do agree that the embryo should be treated with respect'.[8] So the difference is not between embryos with no moral status at all and full moral status, but between embryos with full moral status and embryos with a somewhat lesser status—a difference of degree. The implicit assumption underlying the attempts to create differences in moral status is that it is easier to weigh the moral value of embryos against the interests of future patients. But this is an approach which presents considerable difficulties (see below). Another approach is to take seriously the fact that all political parties subscribe to a moral status for embryos. Can this be taken as a starting point for public policy? In The Netherlands this would not be without a precedent.

Respect for Unborn Human Life

In the abortion debate three basic positions can be discerned with regard to the moral status of new unborn human life. The first emphasizes the continuity of the process of development and gives full protection to the developing embryo (fetus) from the moment the new genome has been formed. In this approach abortion is not permitted. The second position emphasizes a discontinuity in development. A distinction is made between human life and personhood, and a fully protected status to unborn human life is given only from the moment it has the status of person. This moment is fiercely debated, however. There is neither agreement about which characteristics are typical of persons, nor is there consensus with regard to the moment personhood begins. The advantage of a distinction in moral status is, however, that it permits abortion up to the moment the fetus is ascribed personhood, because the lesser moral status of the developing human life makes it easier to weigh it against the interests of others (mother or parents). The third position emphasizes a gradual growth of a fertilized ovum into a human person. As the developing human life grows it is given greater moral weight. The early embryo deserves protection, but a fetus of three or four months deserves more protection. In other words, the more the unborn human life develops, the weightier the arguments must be to terminate pregnancy.

The discontinuous and the developmental approach have in common that a lesser moral status is assigned to the embryonic and early fetal stage—but not without considerable difficulties. Both approaches are to a certain extent vague.

It is not at all clear what sort of protection an embryo or early fetus ought to be given, and, consequently, which interests are compelling enough to justify termination of pregnancy. In addition, the gradual approach offers no concrete criterion. This partly explains why it is seldom used in legislation, where a very definite stage (or time) in the development of the fetus usually defines the limits of induced abortion.

It is important to note that there is common ground. The first approach (continuity) gives full moral status to unborn life, independent from its stage or form. The discontinuous and developmental approaches assign embryos and early fetuses a lesser moral status. All three positions recognize, however, that early unborn human life does deserve moral respect. In the past this common basis could form the basis for the introduction of abortion legislation. The Christian Democrats did not give up their position of full moral status for the fetus. Given the fact that abortion legislation was unavoidable in view of the social and political support for it at the time, they aimed at the next best thing—the greatest possible reduction of the number of abortions. Accepting that termination of a pregnancy can sometimes be justified in complex and exceptional cases, even for those who support full protection of the fetus, they limited abortion to only those emergency situations of real physical and/or psychological crisis. The other parties could not but accept their position, because they too recognized that moral respect was due to the fetus.

The question can be raised whether a similar "embryo-saving" policy with regard to embryos is feasible and morally defensible. Before this question is answered a brief exploration of the moral issues created by the instrumental use of embryos for stem cell research is useful.

Embryos and Moral Ingenuity (2)

Research with human embryonic stem cells is undertaken because of their (assumed) 'potential for significant advances in tissue transplantation, pharmaceutical testing and embryology'.[9] Destruction of a human embryo is not justifiable for those who seek full protection for the embryo. But those who accept a lesser moral status face a difficult question: which (therapeutic) interests have more weight than the protection of early forms of human life? Such a weighing of interests is complex.

In much of the present moral debate it is assumed that the interests of (future) patients with degenerative and debilitating diseases outweigh a lesser moral status of embryos. Embryos can therefore be justified for use in medical research or for new therapies. It proves very difficult, however, to determine precisely which therapeutic aims are weighty enough to morally justify instrumental use of embryos for research. Precise and concrete criteria to determine this have not yet been offered and until now the balancing of interests tends to be intuitive, precisely because the specific moral status of embryos has not been defined yet, and, consequently, the degree of moral respect they deserve. It is not clear in advance which forms of research are important enough. Therefore there is a real possibility that, because of lack of criteria, there is a more or less ad hoc solution, subject to scientific, financial, or patient pressure.

The impossibility of defining precise limits may have been one of the reasons that other ingenious arguments have been put forward to defend embryonic stem cell research. Analogies have been sought which could justify instrumental use of embryos, but they are not thoroughly convincing, as the following examples demonstrate.

(a) One justification is based on a comparison made with soldiers who expose themselves to life-threatening situations in war to serve a greater cause.10 This analogy is weak, because embryos cannot possibly make a conscious choice to sacrifice themselves. Soldiers do have this choice, and if they do not, there is a reasonable chance and in most cases the explicit intention of survival, unlike in the situation of embryo research.

(b) Another analogy is based on the principle of solidarity. Instrumental use of embryos for therapeutic research can be interpreted as sacrificing embryos for a greater and common good.11 Eventually it will be to the benefit of many who are seriously ill. This argument can also be rejected. The embryo has no choice; others determine whether it should be sacrificed for reasons of solidarity. A possible objection based on the fact that parents decide for their offspring when they cannot decide for themselves can also be rejected, because the implicit assumption of parental decisions is that parents decide in the interest of their child. A parental choice to destroy the embryo can hardly be seen as such.

(c) Embryos have also been compared to innocent citizens who are killed in a war.12 To achieve greater aims (e.g., the upholding of democracy, the destruction of dictatorship, or the annihilation of terrorism), sometimes (large numbers of) citizens are sacrificed. This is also a curious analogy. Killing citizens can sometimes be unavoidable to achieve the aims named above. But the word unavoidable is crucial. In embryo research such a predicament does not yet exist. It is not unavoidable, especially when alternative forms of medical research (research with adult, fetal, or umbilical cord stem cells) also prove to be promising.13

(d) It is inconsistent to accept termination of pregnancy and reject embryo research.14 This argument is also rather far-fetched. It will certainly not be acceptable for those defending full protection. But it is also not a good argument for those accepting a lesser moral status for embryos than for a fetus (the developmental approach). Induced abortion can only be defended in situations of crisis. Using embryos for therapeutic purposes can not be defined as a crisis situation, neither physically nor psychologically.

(e) The claim of the mother that she can decide over her own body (and therefore about donation of embryos for research) is not a good argument either. The decision is not about the mother's own body but about a potentially new human being. When a mother decides to provide embryos for therapeutic research she decides about their destruction for a purpose not related to either herself or the embryo.

Implications for Public Policy

The difficulties of moral justification of differences in the moral status of embryos as well as the unconvincing moral arguments in support of the instrumental use of embryos have not led to a change in the basic position of the Christian Democrats in The Netherlands. But they now have to accept the fact that legislation with regard to the embryonic research was introduced which they did not, indeed, could not support. They still completely endorse the principle of full protection of unborn human life from its earliest beginning. The political difficulty for them is, however, to find different ways to uphold this principle of full protection of the embryo in a situation where there is no parliamentary majority which agrees on changing the law and where political coalitions are necessary with parties who do not support their viewpoint.

Earlier, in connection with the abortion issue, we noted that in spite of differences in moral status assigned to unborn human life, public policy with regard to termination of pregnancy could be based on the fact that there was no disagreement among the political parties about the position that all forms of unborn human life deserve moral respect. This led to legislation aiming to reduce the number of abortions as much as possible. If this is taken as an example to determine a common policy of maximal reduction of use of embryos for research, the Christian Democrats have to answer three questions. (1) Is this politically feasible? (2) Is this policy in line with the principle of full moral respect for embryos? (3) How can such a policy be given form?

(1) The feasibility of such a policy is dependent on three conditions. The first is that a central government should not limit itself only to the development of procedures to enable interested parties to weigh and balance their interests. The second is that a central government should recognize that it has a moral responsibility of its own. Especially with regard to the protection of (all forms of) human life a government has a normative task. Although important, it is not enough for a government to base public policy on public opinion and public debate. The moral status of embryos should not depend only on the degree of social support that happens to be present in a specific community. The third condition is that all political parties which do not support a full moral status for embryos, but which subscribe to a 'lesser' moral status for embryos, should take this position *very seriously*. The real implication of this stance should not be that political parties offer possibilities to 'destroy what one respects', but that they see it as their duty to do one's utmost to reduce the total number of embryos destroyed for research purposes. For a coalition government in which political parties ascribe varying degrees of moral status to embryos this can form a basis for common policy. Such a policy is based on the biological fact that the creation of a new genome starts the development towards a new human individual. It is this process of development which deserves maximum protection.

(2) For the Christian Democrats in The Netherlands an 'embryo-saving' policy is defensible for a number of reasons. In the first place they can point to a precedent. With regard to the introduction of abortion legislation the choice was for a policy of maximum reduction of induced abortions and permission only in situations of great emergency when alternatives are absent. True, in practice a wider interpretation is often given to this condition, but this is an important reason for the Christian Democrats to demand a thorough assessment of the present practice. Secondly, the fundamental position with regard to the moral status of unborn human life is not

abandoned. It is only given a different form through a shift in emphasis, and in view of the current political context and majorities. Now that the Embryo Protection Act has been passed, the aim can no longer be to forbid the instrumental use of embryos. Instead, the focus becomes to minimize the number of embryos used for research wherever and whenever possible. In accordance with the position on abortion the instrumental use of embryos should be regarded as exceptional and only be considered when there are truly no alternatives. Thirdly, the major purpose of this change in emphasis is first and foremost the prevention of a general moral devaluation of embryos. As illustrated above, this is a real possibility.

One objection to such an embryo-saving policy is that promising therapies for serious and debilitating diseases thus blocked, but the question remains whether this reproach is fully justified. The present state of the art in stem cell research does not make clear that human embryonic stem cell research is the only alternative left for developing therapies.15 True, a choice for a specific sort of stem cells (e.g., fetal or adult stem cells) does imply a restriction of research possibilities which can cut off the development of some therapeutic possibilities. But at present there is no certainty about this. Also, it is not yet clear how many of the existing cell lines are needed for fundamental research. This justifies a choice for first prioritizing human embryonic stem cell research, which is more morally controversial. Now the crucial moral question is whether more rapid research results counterbalance a broad societal diminishing respect for human embryos. A morally convincing public policy will be grounded on the presupposition that first the morally most defensible route will be taken before morally controversial routes are pursued.

(3) Such an approach can have important policy consequences for human embryonic stem cell research. These include:

- In fertility treatments every effort should be made to restrict the creation of excess embryos.
- Selection of embryos in petri to avoid multiple births should be reduced.
- 'Extra' embryos should not be created in an IVF procedure.
- No human embryonic stem cell research should be undertaken before it is clear that alternatives do not lead to successful therapies. Preference should be given to research on adult stem cells, not embryonic stem cells. Embryonic stem cell research should only be undertaken when it is clear the alternatives do not lead to real therapeutic options.
- There should be active (financial) stimulation of research with stem cells from other sources (including fetal tissue).
- Import and use of existing cell lines should be accepted, although this should not lead to an increase in the creation of new embryos for research abroad. In this time of globalization and international regulation and legislation one is also morally responsible for what happens abroad.
- Use of totipotent embryonic cells for further research should be forbidden.
- Use of spare embryos is only permitted if the alternative forms of research are not successful.
- The creation of new embryos for research purposes must be forbidden.

If political coalition parties can agree on such a policy, there is a real possibility that a social devaluation of the moral status of embryos can be stopped. **E&M**

Acknowledgements

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References

1 M.J. Meyer and L.J. Nelson, "Respecting What We Destroy. Reflections on Embryo Research," *Hastings Center Report* 31, no 1 (2001): 16.

2 J. Robertson, "Ethics and Policy in Embryonic Stem Cell Research," K*ennedy Institute of Ethics Journal* 9, no 2 (1999): 109-136.

3 Wet Houdende Regels inzake Handelingen met Geslachtscellen en Embryo's (Embryo Protection Act), 1 September 2002.

4 G. McGee and A.L. Caplan, "What's in the Dish," *Hastings Center Report* 29, no 2 (1999): 36-38.

5 Scientific Institute for Public Policy of the Christian Democratic Party, *Naar Humane Biotechnology (Towards a Human[e] Biotechnology)*, The Hague: CDA, 2003.

6 National Bioethics Advisory Commission, *Ethical Issues in Human Stem Cell Research*, Rockville, 1999, p. 55.

7 McGee and Caplan, "What's in the Dish".

8 G. Meilaender, "The Point of a Ban, Or, How to Think about Stem Cell Research," *Hastings Center Report*, 31, no 1 (2001): 9-16. See also, for example, Geron Ethics Advisory Board, "Research with Human Embryonic Stem Cells: Ethical Considerations," *Hastings Center*

Report 29, no 2 (1999): 31-36.

9 Geron Ethics Advisory Board, "Research with Human Embryonic Stem Cells: Ethical Considerations," p. 31.

10 McGee and Caplan, "What's in the Dish".

11 McGee and Caplan, "What's in the Dish".

12 McGee and Caplan, "What's in the Dish"; Meilaender, "The Point of a Ban".

13 E.g., National Institutes of Health, *Stem Cells: Scientific Progress and Future Research Directions*, July 2001, Executive Summary, http://hhs.gov.news/. P. Aldhous, "Can they rebuild us?", *Nature* 410, 5 April (2001): 622-625. R. Lovell-Badge, "The Future for Stem

Cell Research", *Nature* 414, 1 November (2001): 88-91.

14 Interview A. Fischer, *Die Zeit*, 35/2000, http://www.zeit.de/2000/35/Wissen

15 See n. 13.