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Is preimplantation genetic diagnosis ethically acceptable?

_Original Article

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Abstract French and German abstracts see p. 86 & 87

Preimplantation genetic diagnosis (PGD) implies severe risks for the mother and is not fully reliable in its diagnostic power. The main ethically relevant problem, however, is the fact that many embryos have to be generated in order to select the «suitable» ones, some of which are then transferred into the uterus. All the remaining embryos are either discarded, or used for research and for the extraction of embryonic stem cells. This means that embryos are produced in great number, to be killed immediately or after being used by research. A biological as well as philosophical analysis of the status of the embryo is presented here. It shows that the embryo has to be regarded as a person from fertilization on. A person is not a property which increases in value with development as the respect model claims. It is the subject of all its properties and may not be subordinated to the weighing of values. Since PGD at present is not feasible without destroying totipotent cells and embryos, it is ethically not acceptable.

Key words: Status of the embryo; individuum; person; self organization

There are two forms of preimplantation genetic diagnosis (PGD), the polar body biopsy and the embryo biopsy. According to the present state of knowledge the polar body biopsy does not influence the further development of the impregnated oocyte and does not pose important ethical problems. That is why it is not discussed here. The embryo biopsy, however, raises severe problems. To carry it out, at least 9 or 10 embryos have to be created by in-vitro fertilization (IVF). From each of these embryos one or several cells are taken out in a very early stage of its development in order to test them for genetic defects. At present the embryos are usually in the 8-cell stage when their cells are still totipotent. In order to avoid the problem of totipotency, one is trying to develop a technique which allows to take the cells out from the embryo at a later stage of development, e.g. at the blastocyst stage. From those embryos which seem to be genetically intact, usually two or three individuals are selected and implanted into the uterus of the mother. The remaining embryos are discarded, or made available for research or for extraction of embryonic stem cells.

Problems and risks

PGD is often presented as the procedure of choice to prevent the implantation and birth of children with severe genetic defects. In advance of any ethical judgement, however, problems and risks related to PGD in the purely medical sense have to be pointed out. First of all, the risks to women must be underlined (1, 57–64; 2; 3; 4). As a result of hormonal pre-treatment, an ovarian hyperstimulation syndrome (OHSS) can occur. It is characterized by acute side

effects which vary from relatively mild to severe courses. «Mild manifestations of OHSS are fairly common, occurring in up to a third of exogenous gonadotropin-induced superovulation cycles» (5, 181). Severe cases are much less common but can be life-threatening (5). Additional side effects due to the hormone treatment in the long run cannot be excluded, e.g. there is an increased probability that an ovarian carcinoma may occur.

PGD also entails higher risks for the embryo and the course of pregnancy. People are claiming that the extraction of one or two cells from the embryo at the 8-cell stage does not impair the embryo's viability. In reality, however, there is no certainty that the embryos will develop in the same way as it would have, had no cells been taken out (1, 52–57). When two cells are taken from an embryo at the 8-cell stage, one quarter of the total number of cells is lost. In addition, as shown by experiments (6), one has to take into consideration that in spite of totipotency a certain specialization and distribution of functions in individual cells may have already taken place. Today one cannot state with certainty that this specialization is fully reversible.

PGD is not able to detect multifactorial diseases. In monogenic diseases there is a probability of 5 to 10% that the diagnosis is wrong (7). According to another study (8), 4% of the babies were born with malformations although they had undergone PGD. Due to this uncertainty it is recommended that the concerned couple should undergo a prenatal diagnosis (PD) after implantation. This means that the PD has not been made superfluous by the appearance of PGD.

Preimplantation genetic screening which is an adaptation of PGD for couples without a specific genetic disorder but with a high risk of aneuploidy (too many or too few chromosomes) entails several problems. Only two of these problems are mentioned here. First, there was an increased likelihood of aneuploidy associated with standard ovarian-stimulation routines. The explanation for this phenomenon may be that PGD appears to interfere with the natural screening and selection process. Second, PGD for aneuploidy significantly reduced the live-birth rate (9).

Finally the diagnostic certainty of the PGD is limited by the phenomenon of mosaicism. Chromosomal mosaicism means that two or more cell lines with different karyotypes are present in the embryo (10; 7). Therefore, the biopsy of a single cell may not be representative of the genetic constellation of the embryo (11; 12; 7). In principle, this problem cannot be eliminated completely.

Opinions and facts

PGD has been discussed for several years. Since there reports on opinions and their change with time already exist, it may not be necessary to repeat these reports here (13; 1; 14). However, it is important for our further consideration to state some facts.

1. In the present state of the art PGD is carried out on embryos in the 8-cell stage. The cells taken out for analysis at this stage are totipotent – they are capable of developing into a complete embryo. For this reason these totipotent cells are regarded as equivalent to embryos according to German legislation for the protection of embryos (Embryonenschutzgesetz ESchG §8, Abs.1). These cells are destroyed by PGD. According to the ESchG this procedure is an embryo-consuming investigation. This is one of the main reasons why PGD is forbidden in Germany.
2. In order to achieve a fairly reliable diagnosis with PGD, at least 9 or 10 embryos are used, by far more than the number required for IVF. From this large number, embryos that appear to be healthy are selected. Of these selected embryos, a certain number is transferred into the uterus. The remaining embryos are frozen, killed, or become «supernumerary» embryos used for research or for the extraction of embryonic stem cells.
3. Advocates of PGD always insist that one should have a law which allows PGD for particular cases and prevents misuse by strict controls and crash barriers. It has to be stated, however, that misuse already takes place now. In 9% of cases, PGD is used for social sex selection and family planning (15). In some countries «saviour siblings» are selected to serve as immunocompatible organ donors (16; 17). The Swiss National Advisory Commission on Biomedical Ethics (NEK-CNE) had rejected the production of saviour siblings in its Opinion 10/2005. Two years later the majority of the NEK-CNE underwent a complete reversal in its Opinion 14/2007 and recommended the production of suitable tissue donors (18).

The fact that PGD is already misused now induces us to suspect that PGD will in future be used for genetic manipulation and for the production of embryonic stem cells. Experience tells us that limitations set by crash barriers are violated again and again. «Would it be possible to maintain such limitations when the permission is given on principle? Does this not contradict to all the experience which we made during life?»¹

It is quite astonishing that some people, including the majority of the NEK, are not worried by the consumption of embryos and totipotent cells which is caused by PGD. They do not care about the problem of the status of the embryo, or think that this problem is solved already in the sense of the respect model. According to this model the embryo's dignity and right to life are not given in the sense of being all or nothing, but increase gradually with time as a function of the developmental stage. The conviction that the embryo is a person from fertilization onwards is characterized as an individual morality («partikuläre Moral») by the NEK. It cannot be justified that in a pluralistic and liberal society the state should enforce an individual morality as a general doctrine (18, 5). On this background the life of the embryo is just a value which is weighed against other values. What is considered to be a value, and what is the weight of such a value, ultimately results from acceptance by society. Pursuing this procedure means that ethics is no longer founded on reason which recognizes what is morally good, as has been pointed out by all the great ethicists in the history of philosophy from Aristotle on. It is rather understood as a democratic process. What is regarded as morally good or permitted depends on the actual majority in a given society. This can easily be seen in the so called respect model which is accepted by the majority of the NEK and which is interpreted differently by different advocates (20).

The status of the embryo

Whether or not PGD should be allowed does not depend on various forms of weighing different values, but on a basic agreement regarding the status of the embryo. Here three different opinions can be distinguished.

1. The «normative» procedure defines from which time onwards the embryo has to be regarded as a human individual worthy of protection.
2. Gradualism, represented mainly in the respect model, concedes a certain moral value from fertilization onwards. This value increases with development and finally ends up at the value which applies to adults. Correspondingly, the right to the protection of life increases with time.
3. The embryo is a person from fertilization onwards (person model). Therefore, it has a full right to the protection of life, from its beginning. It can be subjected to deliberation of goods and harms only when life is in conflict with another life.

¹ Johannes Rau, former president of the Federal Republic of Germany. Quoted from (19, 278).

The «normative» procedure

The «normative» procedure declares that the embryo is not a human being by its mere existence, but only when it is acknowledged as such by other human beings (21). It defines on its own when the embryo has to be regarded as a human individual with full rights to life. This position, however, cannot avoid referring to developmental phenomena to some extent. Since the reasons for the normative definition vary, there is also variation as to the point in time from which an embryo is regarded as a human being. A few examples of such definitions are presented in the following without any claim to completeness.

After fertilization the earliest moment which is proposed is the transition from the 4-cell to the 8-cell stage. In this transition period, transcription from the embryonic nuclear DNA begins (22). Some claim that only from this moment on the embryo is controlling its own development. Critiques of this position have stated that the maternal information in the cytoplasm (RNA molecules) also belongs to the embryo. This information seems to be sufficient for protein synthesis before transcription begins. Although we do not yet have precise data, we may assume that transcription is initiated by epigenetic processes in the embryo when it is needed (23).

Using different arguments, some people claim that an embryo's personhood begins with implantation only. Vosenkuhl refuses to understand the zygote as a «future human being» or as a «potential person» because «at best 10 percent of all zygotes will implant into the uterus» (24).² This is clearly an instance of the naturalistic fallacy. This argument is of the same category as to say: The life of men is of low value because the Vesuvius killed so many people in 79 A.D, as did the Tsunami on December 26th 2004.

Kummer and Nüsslein-Volhard presented the opinion that the embryo is a human being only when it is implanted into the uterus because the uterus is necessary for the formation of body axes (Kummer (25)), and the completion of the developmental program (Nüsslein-Volhard (26)), respectively. After he was confronted with the actual embryological data, Kummer had to concede that the body axes are already laid out before implantation. He had to admit that from fertilization on the embryo has «the ontological status of a completely organized being» (27). With respect to the completion and control of the developmental program as postulated by Nüsslein-Volhard, there is no evidence.

Some time ago, the formation of the primitive streak has been considered as the moment when the embryo becomes a human being (28; 29; 30; 31). And indeed, the problem of monozygotic twins is not an easy one. A solution is possible if twinning is explained as bifurcation by system theory (32) or budding by developmental biology (23). At any rate the phenomenon of twinning will not rule out the fact that the embryo is an individuum before and after twin formation. This is illustrated by Smith and Brogaard. «Consider the United States in the period immediately prior to the Civil War, a time when, as we know, a separation of a single whole entity into two parts was still possible. The United States was then actually one but potentially two. But separation did not in fact occur. Could we not then say, by parity of reasoning, that, at the stage when twinning via separation is still possible but does not in fact occur, the whole foster is transtemporally identical to the human being who exists after birth?» (33, 68) Today the argument of twinning has lost in importance because the preimplantation period suffices for gaining embryonic stem cells. Correspondingly, the NEK has also brought the date from which the life of an embryo should be protected forward from day 14 to the end of the blastocyst stage (34, 67).

The development of the nervous system has also been proposed as the date when the embryo should become a person (35; 36). Sass proposes the 57th day after fertilization. This date, however, is not defensible, be it only for biological reasons. If the formation of synapses is taken as a criterion, then it has to be stated that this begins in various subsystems at various periods of time. This phenomenon is moreover of very long duration. If the development of the cerebral cortex and of cortico-thalamic loops is taken to be a biological basis for consciousness, one has to wait until the late foetal period has arrived. Voluntary, conscious acts can occur only much later. To determine a date for the beginning of personhood on the basis of the development of the nervous system ends up being purely arbitrary.

For legislation, in particular, birth appeared to be the right moment to call the human being a person (37). This argument has lost its plausibility on biological grounds. Due to the progress of medical possibilities, the date of birth and the state of the newborn's maturation varies to such an extent that it cannot be regarded as a clear boundary. To hold birth as the right date for becoming a human person «would mean that a premature baby is protected while other children may be killed even at an age of nine months» (38, 52f).

The multiplicity of different proposals already indicates that none of them is convincing. For each of these proposals, there are important reasons which force us to reject it.

2 The same argument can be found in «Erläuternder Bericht zum Entwurf zu einem Bundesgesetz über die Forschung an überzähligen Embryonen und embryonalen Stammzellen der Schweiz» (Embryonenforschungsgesetz EFG), Bern 2002, p. 59.

Gradualism

The «normative» procedure defines a point in time during development at which the embryo has to be recognized as a human individual or person. From there on, his right to life should be protected. This point in time is regarded, so to speak, as a jump from a non-human to a human being, from a thing to a person. In contrast with that position, gradualism recognizes the embryo as a human being from fertilization onwards but does not grant it full dignity or the right for its life to be protected. The moral status of the embryo is understood as a function of its developmental progress. The further the embryo is developed, the more it may claim the right to its life (39). Representatives of gradualism are, however, divided with regard to the question when the embryo or fetus should ultimately have full moral status and protection of its life (1).

Gradualism has to face the same difficulties of defining borderlines as we have seen in the «normative» procedure. Even more important, however, is the fact that gradualism and the respect model do not explain what an increasing dignity or a progressive right to life should be, and how either can be determined. Suppose that dignity and right to life can be determined in a gradual manner, how much dignity does an embryo have at a particular stage in its development (e.g. Carnegie stages 1 to 23 or weeks in the fetal period)? What are the criteria for this determination? How are conclusions drawn for the right to life? How can arbitrariness be excluded? Further important distinctions are necessary here. It does not make sense to attribute all human rights defined by the United Nations (e.g. the freedom of opinion) to an embryo as long as the embryo does not have the capability to use these rights. The right to life, however, is fundamental for the embryo also. In contrast to other rights, it cannot be restricted or limited. It is indivisible and nonnegotiable, because life is the *conditio sine qua non* for the further development of the embryo (40). The embryo develops on its own. During development it unfolds its potentials and transforms them into actual abilities.

The embryo as a person

Although the «normative» position regards biological facts as irrelevant for attributing personhood and dignity, it refers to biological facts all the time. Gradualism is related even more closely with the embryo's development. Obviously, the question of personhood and dignity cannot be answered without paying attention to the embryo's biological development. However, it is also clear that personhood and dignity are not embryological concepts but are philosophical in origin. How, then, can embryological facts be put into relation with philosophical concepts? We have to find bridging concepts – concepts that form a bridge between the two disciplines. They should be used in the biological as well as philosophical sciences and they should be precisely definable in their actual

context. There should be certain domains to which the meaning of these concepts corresponds in both disciplines. This should be possible with the concept of the *individuum*. This concept can be defined biologically. At the same time, it is an important element in the philosophical concept of a person. We will now examine this concept. As a first step we will ask whether or not we are entitled to understand the embryo as an *individuum* in the biological sense. In a second step we will examine how this biological concept relates to the philosophical understanding of person.

The embryo as an *individuum*

A living being is an *individuum* if it has at least the following properties: Firstly, it forms a unity in space and time. Secondly, it organizes itself as a uniform system. Thirdly, it remains identical with itself throughout time although its appearance changes. This property is called diachronic identity. Fourthly, the human *individuum* is characterized by a human nervous system or by the potentiality to develop such a nervous system. With these properties, the concept of a human *individuum* in a biological sense can be constituted. The explicit formulation of these properties allows us to examine whether or not this concept can be applied to the human being in all its stages of development.

Unity in space and time

Each cell demarcates itself from its environment by its cellular membrane. The zygote has an additional cover, called the *zona pellucida* (41). The *zona pellucida* guarantees that unity is maintained during further development when the number of cells increases in the blastomere and in the early blastocyst stages. The cells of the embryo increase rapidly in number and use the available space within the *zona pellucida* optimally. During the phase of compaction two main types of cell division appear, by which external and internal cells are produced. The outer cells form the trophoblast; the inner cells form the embryoblast. As the trophoblast develops, the *zona pellucida* is broken up. The blastocyst «hatches». After hatching it is free and increases in mass. By the trophoblast, the unity of the blastocyst is maintained. The trophoblast is able to adjust itself to the increasing size of the embryo; it serves as an interface for communication with the maternal organism and enables implantation into the uterus. Thus, the embryo together with its cover (*zona pellucida* first, trophoblast later) occupies a particular position in space and time, demarcates itself from its environment, communicates with this environment and forms a structural and functional unit.

A uniform and self-organizing system

Right from fertilization, the embryo steers its own vital functions in an autopoietic sense and reveals itself as a uniform self-organizing system. It sends signals to the maternal organism, which start the dialogue between the embryo and its mother, and contribute to the fine tuning of the embryonic and maternal systems. The embryo-maternal dialogue begins in the preimplantation period already (42).

This dialogue is already decisive before implantation for a successful pregnancy. Three signals are particularly emphasized: human chorionic gonadotropin (HCG), early pregnancy factor (EPF) and platelet activating factor (PAF).³

In the recent past, one could observe with an increasing frequency that some scientists and politicians called this uniform self-organizing system a «clump of cells» («Zellhaufen»). This expression was intended to state that the embryo is, at this stage, an unorganized entity of no value. This statement seemed to be supported by micrographs which show the embryo in the blastomere stage as a mere accumulation of cells. In reality, however, for the purpose of these micrographs, the *zona pellucida*, which guarantees the unity of the embryo, was removed. By this removal, a clump of cells was produced artificially.

The claim that the embryo is just a clump of cells is in conflict with the finding that, in the blastomere stage, cells already begin to specialize and distribute tasks among themselves. This is for example shown by the experiments of Antczak and Van Blerkom (6). Using immunofluorescence and laser scanning microscopy, the authors found the regulatory proteins STAT3 and leptin to be polarized and differentially distributed within the cells of the preimplantation stage embryo. This finding indicates that individual blastomere cells begin to specialize in certain functions.

Diachronic identity

Embryologists and molecular biologists agree that the embryo develops in a continuous manner from fertilization onwards. Neither on the various levels of morphologic observation, nor in molecular biology, can discontinuities or turning points be observed. Each developmental process follows continuously from the preceding state. The embryo determines its own development. It is capable by itself to differentiate and mature to the adult state. It depends on suitable environmental conditions, such as nutrition and housing, which are necessary for it – as for adults – but not constitutive. Its own active potentiality will advance its development by itself. While it develops it remains identical with itself, although it changes its appearance. This is what is meant by the term diachronic identity.

Human nervous system

The embryo is an individuum with the potentiality to produce a human nervous system. The nervous system is the necessary condition for the development of mental acts and for communication with the environment. This potentiality is essential for human nature.

As development progresses the nervous system takes control over the essential processes in the individuum. This does not mean, however, that individuality is restricted to the nervous system. The nervous system is an extremely important and necessary element of the self-organizing system but not the system as a whole. Many subsystems, such as genetic information, circulation, hormonal control, the immune system, and others cooperate. It is largely unknown how the ensemble of these subsystems produces the unity and autonomy of the individuum. It is clear, however, that the individuum cannot continue to live without the nervous system when a certain developmental stage has been reached.

Individuum and person

The analysis of the biological status which is presented here shows that the embryo has to be regarded as an individuum in the biological sense. What is the relevance of this result for the philosophical question regarding whether or not the embryo is a person?

The classical definition of person, which has remained valid, was formulated by the antique philosopher Boethius. It states: «A person is an individual substance of a rational nature».⁴ In order to go beyond the biological level and reach the ontological level, it must first be clarified whether the individuum in the biological sense has to be regarded as an individual substance, and secondly if the nature of this individuum is rational.

The ontology of substance was already well elaborated by Aristotle. In the interpretation of B. Smith and B. Brogaard «human beings and other organic individuals are three-dimensional spatially extended entities which exist in toto at any time at which they exist at all» (33, 47). «Each human being ... is therefore a substance in Aristotle's sense, which means that under normal circumstances it satisfies the following ... conditions». It is «a bearer of change» (condition 1). «It cannot continue to exist and become a different substance» (condition 2). It is «extended in space» and «possesses its own complete, connected external boundary». This boundary is formed by a cover which «serves as a shield to protect the entity from ... causal influences deriving from its exterior» (33, 50) (conditions 3, 4, 7, 9). «Each substance is connected in the sense that its parts are not separated from each other by spatial gaps» (33, 47) (condition 5).

3 For further information on the role of these factors see (23).

4 «Reperta personae est definitio: naturae rationabilis individua substantia». Contra Eutythen et Nestorium III (43).

«Each substance is an independent entity in the sense that it does not require the existence of any other entity in order to exist» (33, 48) (condition 6). The entity regulates its own internal milieu and «contains in itself mechanisms for reconstituting or replacing its external membrane or covering in case of damage» (33, 50).

As seen earlier, the embryo fulfils these conditions from fertilization onwards. It is a unity in space and time. It is surrounded by a protective cover: the *zona pellucida* at first, the trophoblast thereafter. As an individual unit, it is a system which organizes itself right from the beginning to achieve its final appearance as an adult human being. In spite of changes which occur during development, the embryo remains diachronically identical with itself. Therefore, it is an individual in the biological sense. From the point of view of ontology it is an individual substance.⁵

To be of rational nature is the essence (*physis, ousia* with Aristotle) of the human being. It can also be expressed as its form (*morphe*) or soul (*psyche*). The soul is understood as the first entelechy (*entelecheia*) which gives form and perfection to an organic body (45, II 412a27–28). According to Aristotle and many other philosophers, natural beings are determined by fundamental properties like potentiality (*dynamis*) and actuality (*energeia*). Potentiality is not just a mere possibility but an active power to develop into its actuality. It is directed to the realization of its final state (46, IX chapters 6–9). This concept has been systematized by Thomas Aquinas. Aquinas distinguishes an active and a passive potentiality (*potentia activa, potentia passiva*). A being has an active potentiality if it is able to produce its actuality by itself (*capacitas ad actum producendum*). The nature of the human being is that it is rational. The biological correlate of rationality is the nervous system. Since the human embryo has the active potentiality to develop a human nervous system, it is of a rational nature. Thus, the philosophical reflection on biological data justifies the ontological conclusion: the human embryo is an individual substance of a rational nature and, therefore, a person according to the definition of Boethius.

The embryo in-vivo and in-vitro

With respect to biological criteria the embryo in-vitro is identical with the embryo in-vivo (47). An important difference is produced insofar as, due to implantation, the in-vivo embryo can continue to develop under suitable environmental conditions while the in-vitro embryo is deprived of these conditions. With regard to their intrinsic properties the in-

tra- and extracorporeal embryos are identical. By its extrinsic properties, which are imposed by third parties to the in-vitro embryo, the two paths of embryonic existence differ.⁶

Some people deny the right to life of the extracorporeal embryo because this embryo has no aim, no *telos* anymore. It cannot deploy its potentiality to become an adult human being. By experimental interventions, they even try to change the genetic program in such a way as to eliminate the embryo's developmental potential. If one first impairs the developmental potential of the embryo and then argues that the impaired embryo is no longer worthy of protection because it has no future, then this behaviour is quite illogical and unjustifiable. The conclusions inferred from these interventions should be quite the opposite. If the embryo is in danger of its life due to the fact that it is produced in-vitro, then everything should be undertaken to protect its right to life.

Conclusion

Our analysis has shown that the human embryo in-vivo and in-vitro has to be regarded as a person from fertilization onwards, although it still has to unfold its potentiality into actuality. If the embryo is a person, then it has the right to be protected. This consequence is not a question of individual morality («partikuläre Moral»), as some members of the NEK believe, but the fundamental right of all human beings in the world. From this fundamental right it follows that totipotent cells may not be wasted for diagnostic purposes, and embryos may not be generated in order to select the «suitable» ones, and discard the others or use them for research, as is the case in PGD.⁷ To submit the right to life of embryos to the balance of values against other values is ethically not acceptable.

Conflicts of interests: The author has no conflict of interest in relation to this article.

Zusammenfassung

Ist die Präimplantationsdiagnostik ethisch zulässig?

Die Präimplantationsdiagnostik (PID) birgt für die Mutter verschiedene Risiken und ist zudem in ihrer diagnostischen Aussagekraft nicht völlig zuverlässig. Das ethische Hauptproblem aber besteht darin, dass man viele Embryonen erzeugen muss, um unter ihnen die «geeigneten» auswählen zu können, die dann teilweise in den Uterus transferiert werden. Diejenigen Embryonen, die übrig bleiben, werden entweder weggeworfen oder für die Forschung und die Gewinnung von embryonalen Stammzellen genutzt. Das bedeutet, dass eine grosse Zahl von Embryonen nur dafür produziert wird, entweder sofort oder dann nach ihrer Nutzung durch

⁵ Smith and Brogaard also come to the conclusion that the zygote actually fulfils these 10 conditions which prove it to be an individual human being. From the fact that the zygote divides right after being formed they conclude, however, that the zygote cannot be transtemporally identical with the human individual after birth. This interpretation of biological facts is incorrect. The *zona pellucida* is an essential element of the zygote and for the embryo in the blastomere stage (44).

⁶ There is an extensive and profound study on the status of the extracorporeal embryo. See for example the contribution of A. Craig (48).

⁷ «By the fact that embryos are submitted to a «quality test» PGD contributes to a process which has been described as «demoralization of embryos» (1, 213).»

die Forschung vernichtet zu werden. Der Artikel präsentiert sowohl eine biologische als auch eine philosophische Analyse des Status des Embryos. Diese zeigt, dass der Embryo von der Befruchtung an als Person aufgefasst werden muss. Das Personensein ist nicht eine Eigenschaft, deren Wert sich mit zunehmender Entwicklung steigert, wie es das Respektmodell geltend macht. Die Person ist das Subjekt all ihrer Eigenschaften und darf keiner Abwägung verschiedener Werte untergeordnet sein. Die Präimplantationsdiagnostik ist ethisch nicht zulässig, weil sie gegenwärtig nicht ohne die Zerstörung totipotenter Zellen und Embryonen durchführbar ist.

Résumé

Le diagnostic préimplantatoire est-il éthiquement acceptable?

Le diagnostic préimplantatoire (DPI) présente des risques sérieux pour la mère et n'est pas entièrement fiable dans son pouvoir diagnostic. Le problème principal qu'il soulève, cependant, est la nécessité de générer un grand nombre d'embryons pour être en mesure d'en sélectionner un qui soit «adéquat» et qui sera implanté dans l'utérus. Les embryons restants sont soit détruits, soit utilisés dans la recherche et pour l'extraction de cellules souches embryonnaires. Cela signifie que des embryons sont produits en grand nombre, pour être tués immédiatement ou après avoir été utilisés par la recherche. Une analyse biologique et philosophique du statut de l'embryon est présentée dans cet article. Elle montre que l'embryon doit être considéré comme une personne à partir de la fertilisation. Une personne n'est pas une propriété qui augmente en valeur avec le développement, comme le prétend le modèle du respect. C'est le sujet de toutes ses propriétés, et il ne peut être subordonné à une pesée de valeurs. Dès lors que le DPI n'est pas réalisable sans détruire des cellules totipotentes et des embryons, il n'est éthiquement pas acceptable.

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