

The Ethics of Stem Cell Research and Prenatal Genetic Alteration

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Introduction

Technological advancements associated with the medical industry create opportunities to conduct procedures that generate an ethical debate. Our investigation covers stem cell practices and prenatal genetic alteration. Research in these areas has enabled the discovery of ethical extremes in which the medical world must face. These extremes derive the guiding question to preface the following issues: at what point shall we determine procedures in medical and science technology unethical?

Stem Cell Research and Prenatal Genetic Alteration

At a first glance these two topics may seem different, however many similarities exist between them which raise related ethical issues. As highlighted in the following paragraphs, embryonic stem cell research involves killing a human embryo in order to develop these cells. Although prenatal genetic alteration does not technically kill a potential human being, it does fundamentally alter them in a way that cannot be reversed. Given this, it can be argued that prenatal genetic alteration indeed disrupts that person: they will not develop either physically or mentally in their natural state. These two issues raise similar ethical dilemmas in regards to who has the right to make these decisions as well as how far this technology will be developed. As you will see in this paper the actual scientific processes of these practices are dissimilar, but the issues raised and our arguments against the ethics of both medical technologies are linked.

Stem Cell Research

The primary focus of discussion on this matter is ethics surrounding stem cell research. In short, stem cells are “noted for their ability to self-renew and differentiate into a variety of cell types”.¹ To introduce a few measures of medical technology, stem

cells are providing a gateway for therapeutic procedures such as reconstructing skin tissue, repairing organs and treating disease. To the layperson, these medical capabilities may seem necessary and ethical in practice; however, society must be educated in order to recognize the potential harm in using this knowledge.

Embryonic Stem Cells

One major process among several stem cell technologies is the use of embryonic stem cells. These stem cells are found within human embryos, during the initial growth phase of a human being. To further explain, a zygote, or fertilized egg contains blastomeres, which are dividing cells that eventually develop into an embryo and placenta. The key concept to consider here is that blastomeres are totipotent, meaning they have potential to grow into an entire living organism.¹ The blastomeres then become hollow balls called the blastocysts. Within a blastocyst is the inner cell mass, a collection of cells which aid in further embryo development. Human embryonic stem cells are then derived from culturing a sample of the inner cell mass.¹

Is it ethical to utilize medical technology to harvest embryonic stem cells when the embryo itself is discarded? The nature of this debate is largely centered on the question of whether an embryo is classified as a living being or not. We have determined the answer is yes, a living being can ultimately become a human, which one can associate with having conscious thoughts, feelings, and actions. The contrary suggests the answer is no, an embryo cannot be considered a living being, and therefore is insignificant enough to use for research purposes. The stem cell sources under debate, or in this case the embryo, should be classified as alive solely based on the fact that the extracted cells are totipotent, and therefore can become persons.

Social Issues

An opposing side to our argument is that abortions are legal in the United States and therefore choices are already available to women regarding killing a human fetus. Even though this medical technology exists, it is believed the concept is unethical in practice. Similarly, when discussing the ethics of embryonic stem cell procedures, a

potential living being is the primary focus. Like abortions, we believe this medical technology is equally unethical. The only difference is embryonic stem cell procedures take place earlier in the development process.

Stem Cells and Private Industry

In arguing against the ethical nature of stem cell research, additional funding may lead to curing diseases, but may ultimately help less people due to limitations in supply, since embryos must be cultivated from women. For instance, it is relatively easy for companies to adjust for the demand of health care equipment or products, such as x-ray machines. These machines are used to ultimately reduce peoples' medical problems by pinpointing the causes. So if the demand for this equipment rises, then suppliers manufacture more equipment; however, "in a situation where blastocysts...can be used to cure or alleviate certain kinds of deadly or debilitating disease, can private industry be trusted to make enough?".² While research money and human efforts could aim towards advancement of these procedures, other medical technology research that may not involve controversy could loose ground. For example, procedures used to cure cancer patients are not ethically controversial, unlike stem cell procedures. We believe research money and efforts should not shift away from medical technologies used to treat major diseases such as cancer. In discussing the supply and demand of such medical technology, embryonic stem cell procedures should not take place for these reasons.

Stem Cells and Government

Suppose a therapy based from this technology was to cure a disease that does not lead to killing people, or a condition that is mostly unfortunate but not life threatening. In this case we believe it is unethical to extract and develop embryonic stem cells, because it involves terminating potential human beings.² We suggest that treating diseases that are not life threatening is not worth discarding human embryos. This decision may involve a broader level of concern: what are our nation's top priorities? If the United States government and major corporations are adamant towards the advancement of these medical technologies, one should consider that many embryos must be developed, but more importantly terminated.

Making the Ethical Decisions

The ethics involved in such decisions are challenging to pinpoint, especially when society tends to push its degree of accountability off to the next person. For instance, “good public policy depends on informed consensus”.² But then who is most influential and responsible for making the ethical choices and regulations? Possible candidates may include relevant scientists, politicians and religious leaders. Decisions in support of embryonic stem cell technology must indicate that decision makers all agree that the value of an embryo is not worth enough to protect. We determine however, that such a widespread agreement is unlikely in today’s society.

Genetic Alteration

Much like stem cell research, prenatal genetic altering also deals with humans when they are in their earliest developmental stages. Because of this, there are many similar issues between the two topics.

Currently in the United States, 9 out of 10 pregnant women submit to at least some prenatal screening.³ With this screening, we are able to detect 40 genetic defects and diseases.⁴ Much of our abilities to detect such defects are a direct result of the Human Genome Project. This project began in 1999 and was given a 15 year time limit and a budget of \$3 billion in order to map out the entirety of the human genome.⁵ With this research, it is becoming not only possible to identify these defects, but theoretically possible to alter a human’s original genetic structure so that they will be born healthy.

Current Parental Options

Prenatal screening is done by either amniocentesis or chorionic villi sampling during fetal gestation.⁴ If a couple believes they are at risk of having a child with a genetic disease, there are a certain number of options. They can choose not to reproduce at all, accept the risk and reproduce anyway, use artificial reproduction technologies, or use prenatal diagnosis to search for the known disorders and possibly abort an affected child.⁵ Theoretically, the technology is almost available to alter the genetic code so that the child will be healthy no matter what.

Physically Modifying the Human Genome

From a medical standpoint, this may sound promising, but from an ethical standpoint it raises many difficult issues. The first of a list of issues against this “genetic engineering” would be the issue of physically modifying the human genome. This technology allows us to change a human being’s fundamental blueprint. Do parents have the right to make these decisions for their child? Many critics argue that doing this would be an act of “playing god”; making fundamental decisions about a person that they are not aware of.

Social Concerns

It is helpful to examine looming social concerns this technology might raise as well. Our world already rewards people who are born with beauty or athletic abilities, models and sports stars are proof of this. With genetic engineering, this problem would only be exacerbated further. Parents could choose their children’s features and impending physical capabilities. Since these procedures would be expensive, the gap between social classes would grow even wider.³ The wealthy would eventually become healthier overall, and those that could not afford the operation would be put at a disadvantage. Further, society could move from discriminating gender or race (as in today’s world) to discriminating between people that have been genetically altered or not. As soon as the world figured out how to “create” what is believed to be a physically and mentally perfect person, what would stop them from doing so?

Gender Issues

Although picking the characteristics of your child could have severe consequences, simply picking the gender of your child could produce similar results. Whether we like it or not, many people in this world perceive women to have a lower social status than men. Couples with this outlook will choose to have a male child. Not only could this behavior lead to a skewed gender population, but it will also increase the discrimination towards women⁵. If it is seen as more socially beneficial to have a male child, women could develop a strong negative social standing.⁵

De-humanizing Childbirth

Essentially, genetic engineering makes having a child seem like buying a consumer product.⁴ You are able to customize your purchase to get whatever you want, as long as you are able to pay for it. If this is the case, it is difficult to decide if the parent is acting in the best interest of the child. Choices parents make regarding the well being of their offspring are virtually endless; however, deciding one's gender is unethical. Additionally, the child is not able to develop on his/her own, and parents are predisposing their child to develop in a certain way.

Elimination of Genetic Disease

Although serious ethical arguments against genetic engineering exist, there are also strong arguments in favor of this technology. For example, genetic engineering could essentially eliminate genetic disease altogether.⁵ There are 4000 known genetic disorders, and several can already be identified. Some detectable disorders include Tay-Sachs disease, cystic fibrosis, Duchenne muscular dystrophy, Lesch-Nyhan syndrome, Down's syndrome, and sickle cell anemia.⁴ If this technology were to develop, we could eliminate all genetic disease from the human race.

Improving the Human Race

Another argument in favor of genetic engineering results from fundamentally improving human beings. In today's society, we use behavior modification (such as going to school) in order to try and increase people's natural abilities. Genetic alteration may be a much more efficient way to achieve these same goals.⁵ Using this technology, you are essentially making people smarter by avoiding mental retardation and other such things, so why should it be different if you simply increase the child's brain capacity? This may eventually lead to the entire human race becoming increasingly intelligent at a much faster pace than we are currently experiencing.

If couples know they have a strong disposition to a genetic disease, they may originally choose not to risk having a child. Genetic alteration gives disease-prone couples the option to conceive healthy children.

Conclusion

In contemporary society, stem cell practice and prenatal genetic alteration are two groundbreaking technologies capable of crossing barriers regarding medical ethics. From a medical standpoint, these procedures are perceived as beneficial to society. When the ethical issues are examined, however, this technology leads to negative results and ultimately costs lives. In both cases, the public needs to be informed of this technology and educated on both the positives and the negatives of such practices. Only then will society as a whole be able to see the devastating impact this technology could have on the human race and culture. By doing this research and performing these procedures, the impact on human life is too great. Killing human embryos or fundamentally altering human genetic codes is counterproductive towards the natural progression of humanity.

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