SHOULD DESIGNER BABIES BE REGULATED?

By: Alec Madriaga and Natasha Bates

Abstract

Designer babies have been frequently used to help prevent genetic defect of offspring. The two main procedures that can help prevent offspring of having a genetic defect is by IVF. In Vitro Fertilization or PGD, Preimplantation Genetic Disorder. It is a topic currently being debated ethically on whether it is okay to design a baby and how far people may take the procedures to design a baby before it gets out of hand. Two sides can be approached to this topic: Should designer babies be regulated or should it not be regulated? A concern that is plaguing the minds of scientists is whether designer babies will lead to the creation of a super race. There are 7.3 million women (between ages 15-44) in the U.S. that are infertile. There are 2.1 million men and women in the U.S. who cannot conceive a baby (within 12 consecutive months).

In Vitro Fertilization

Louise Brown, the first “test tube baby”, was conceived with the help of a process known as in vitro fertilization (IVF). The process involves taking an egg cell(s) from the woman’s ovaries, exposing it to sperm outside of the body, allowing fertilization, and putting a fertilized egg(s) back into the woman’s uterus. It is a difficult process that requires money and patience because of its low rate of success. There are many risks to IVF. By the end of the experiment, 105 of 311 patients who underwent in vitro fertilization had successful deliveries (Lowe). There were also 40 patients who were in the middle of pregnancy at this time. Research shows that, in average, the probability of a successful treatment decreases as the woman’s age increases (American Pregnancy Association). Despite the low rate of success and the burden it places on the mother, it’s still a popular choice. One of the most frustrating, burdensome, and socially tolerated treatments is PGD. Preimplantation Genetic Disorder, is a reproductive procedure that helps prevent birth defects and avoid genetic diagnosis or termination of pregnancy. It was discovered by Edwards and Gardner in 1968, but didn’t show true success until 1990. PGD can be used to screen X-linked diseases, and chromosome translocations. It can help prevent diseases such as Tay-Sachs disease, Cystic Fibrosis, and Spinal Aplasia. There have been cases where it has been used for sex selection, but has been prohibited in many countries where PGD is allowed. There have been over 1000 live born children after treatment of PGD. The average cost of the 1st cycle of PGD is about $6000 and repeated cycles are about $4500. Preimplantation Genetic Disorder also helps with having an unaltered embryo from the beginning stages of pregnancy resulting in a healthy offspring, but requires the use of IVF. It holds 2 distinct purposes: unambiguously screening to enhance In Vitro Fertilization success, the most common reason used, and detection of genetic disorders when family members are known to have or carry the disease. There a three major approaches to PGD: testing of eggs by removing the first and second polar bodies (PB, and PB2), which is the secondary product of the division process in meiosis. This all occurs before the egg is matured and before the embryo is formed. embryo biopsy at day 3, and embryo biopsy at day 5. The general process of PGD involves one or two cells obtained from a 6-8 cell stage embryo, a stage reached 5days after insemination, or polar body biopsy. A past technique that has been used is zona pellucida is penetrated using acid or laser technology or two muscular aspirated with pellucida. PCR (polymerase chain reaction) is then used to amplify DNA to detect single gene diseases. Extreme precaution must be taken because contamination is crucial. In order for chromosomal analysis to be determined. Fluorescence in-situ hybridization must be used. A second technique, which is simpler and requiring less technology, is Polar body biopsy. Polar body biopsy can be done before fertilization by making a slit in the zona pellucida and drawing at the polar body of the egg with a biopsy pipette. Polar body biopsy only helps to determine the disease is found only for the maternal genes and may be unreliable. If these two procedures do not work, you can then use 2nd polar body, in which eggs are force out after fertilization and after the completion of the mitotic division, (reproductive division of cells). There have been a few concerns about PGD. Some feel that the selection process and the perceived danger of creating designer babies should not be controlled by any kind of authority because it is the women’s choice to undergo the procedures and that hardly has anything to do with anyone else. PGD helped families who have had a long history of inherited diseases. With the diseases embryos eliminated, these families would no longer have to suffer the physical and emotional strain brought on by these ailments. Without any interference from outside organizations, researchers could study the human genetic makeup more efficiently and at a faster pace. The more the scientists find out about what each gene does and which changes have effects on them, the better they can prevent diseases from occurring.

Conclusion

It is understood that many couples do not wish to conceive a genetic defective child due to the hardships that come with having a genetically defective child. Designing a baby to have the desired features has an ethically just reason to do so. Even through IVF and PGD do not guarantee healthy babies, the rapid growth of technology in this field of study, can cause many couples to go to the extreme to creating a perfect child. This can proven to be an unethical reason to design a baby. If your child is already healthy why should you perfect them even more? There have been laws made in the UK, a popular country that uses both IVF and PGD regularly, which only gave licenses for using PGD for specific diseases such as, cystic fibrosis, hemophilia, Beta- thalassemia, sickle-cell disease. Duchennes muscular dystrophy, fragile X-retardation, and Huntington’s disease.

Bibliography


