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Dennis M. Sullivan

Cedarville University, sullivan@cedarville.edu

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Reproductive Ethics: Should We Have ‘Designer Babies?’

Case Study by Dennis Sullivan, MD

You are the pastor of a medium-sized non-denominational Protestant church. Tom and Karen Stevenson are a young couple in your church, and have come to you for moral counsel. The Stevensons have struggled with an unfulfilled desire to have children. Despite a normal physical relationship in their marriage, they have been trying to have a baby without success for the past two years.

Infertility, defined as failure to conceive after 12 months of trying, is not uncommon, affecting 10 to 15% of all couples in the United States. In 50% of cases, there is a problem with the woman, perhaps due to ovulatory failure (inability to produce ova, or eggs), inflammation or scarring of the Fallopian tubes, or inadequate hormonal support. In another 40% of cases, the problem is with the male partner, related to an inadequate sperm count or abnormal sperm motility. In some cases, the cause is unknown.

The Stevensons have been working with a fertility clinic for six months, and have embarked on a cycle of *in vitro* fertilization (IVF). This is an assisted reproductive technology that allows for fertilization of human ova outside the womb, with subsequent implantation (usually when embryos are at the five-day old stage). The costs of IVF are high, at \$10,000 to \$12,000 per attempt, with a success rate of about 40%. Often, such costs are not covered by private health insurance. Tom, a successful businessman, has enough financial resources that this is not a problem, and their desire for a child is very strong.

Normally, a woman has one ovum develop each month (the growth of others is inhibited), which is then released in the middle of each 28-day menstrual cycle. Several weeks ago, Karen began taking powerful hormones to force multiple ova to mature at the same time. Then just a few days ago, specialists at her fertility clinic performed a procedure where they passed a thin needle (under ultrasound guidance) into her pelvis, and harvested all of these developing ova.

In all, 14 ova were harvested from Karen’s body. These were placed into a sterile *Petri* dish, then fertilized with Tom’s sperm. A total of 12 embryos were the result. These embryos have been growing in the clinic laboratory for the past three days.

Questions for Discussion:

1. Tom and Karen are beginning to have second thought about all this. In their enthusiasm for having a child, they did not think about all of the ramifications of this technology. Now that 12 embryos are ready for implantation, they desperately need your advice. First of all, do you think that they have already done something immoral? Should Christians engage in reproductive technologies? Try to identify the moral traditions that may influence your answer. For example, why might Roman Catholics and evangelical Protestants sometimes reach different conclusions?
2. Regardless of your answer to question #1, the Stevensons now have 12 embryos growing in culture, and will have to make some decisions in the near future. All of the following are possible outcomes:
 - a. Some of the embryos may be implanted after 5 days of development (in natural reproduction, it takes an embryo just over 6 days from fertilization to travel down the Fallopian tube to begin implantation). The typical procedure in IVF is to implant 3 or 4 embryos, in the hope that at least 1 or 2 will survive and mature.

- b. Some embryos may be frozen for future use (the cost of implanting frozen embryos is much less; although the success rate is lower, about 25%).
- c. In order to increase the success rate, some centers will implant 6 or 7 embryos, then perform “selective reduction,” where 2-3 weeks after implantation a needle is inserted into the uterus (under ultrasound guidance) and some of the smaller embryos are destroyed.
- d. Some embryos may be frozen in order to donate them for embryonic stem cell research.
- e. In some centers, some embryos may be frozen to donate to other childless couples. This practice is sometimes called “embryo adoption.”
- f. Some unused embryos may be discarded.

What considerations inform your advice to Tom and Karen about the morality of each of these choices?

More complicated questions (the plot thickens!):

It turns out that Tom has a father and a brother with Huntington’s disease. This is an uncommon, genetically transmitted disorder. The trait is autosomal dominant, which means that carriers of the abnormal gene have the disease. Huntington’s disease causes progressive and incurable neurological deterioration, leading gradually to abnormal movements, dementia, and death.

Recently, Tom had a blood test that shows he has the abnormal gene. He has watched his father and older brother struggle with severe symptoms, and Tom knows that he will suffer the same fate. He does not want to bring another child with Huntington’s disease into the world if he can prevent this.

Preimplantation genetic diagnosis (PGD) is a way of screening early embryos for genetic abnormalities. A single cell is removed from a three-day embryo, and analyzed genetically. Removal of the single cell does not seem to severely decrease the viability of the rest of the embryo, and the successful implantation rate is almost the same. Tom would like to use PGD technology to analyze the 12 embryos now in culture, and only implant those without the Huntington trait.

1. How would you respond to this request? Is Tom’s request reasonable? Is it within the range of options available from a Christian perspective?
2. There are other genetically-transmitted disorders that may be detected through PGD. This technology has been used to screen for a variety of monogenic conditions, such as cystic fibrosis, Duchenne muscular dystrophy, hemophilia A, fragile X syndrome, retinitis pigmentosa, and Tay Sach's disease.
3. We have chosen a severe genetic disorder to create sympathy for this couple. In fact, it is also possible to use PGD to practice gender selection. Imagine that Karen has always wanted to have a little girl. What do you think of the idea of implanting only the female (frozen) embryos? The male embryos could be discarded, or (if you wish) donated to another infertile couple.
4. The label “designer babies” has been used as a criticism of PGD for selecting out embryos based on desirable traits. Some have compared this idea to the eugenics movement of the early 20th Century. This idea was based on the idea of “perfecting” the human species, through encouragement of those with “better” genetic traits to have babies, and actually sterilizing the mentally handicapped (and even some minorities) against their will. Partly due to the abuses of the Nazis leading up to WW II, the movement

lost momentum and was condemned as “pseudoscience.” Do you think that genetic selection through PGD is a modern form of eugenics? Why or why not?

Links and References for Further Research:

Mitchell, C.B. “Hurtling Towards Eugenics . . . Again.” Center for Bioethics and Human Dignity.
http://www.cbhd.org/resources/genetics/mitchell_2002-03-07.htm

PGD Background Information (Fertility clinic Web site): <http://www.sydneyivf.com/page.cfm?id=76>

Stem Cell Research Background (Center for Bioethics):
http://www.cedarville.edu/centerforbioethics/files/stem_cell.cfm