Fetal Sex Selection Research Study Approved

By Linda P. McKenzie, J.D., LL.M. Candidate

After nine years, an ethics committee has granted investigators at a Texas medical school approval to conduct a study involving couples who wish to choose the sex of their unborn children. The clinical trial will assess the impact of gender selection on a child’s health and will attempt to identify social effects of choosing the sex of a child, including social factors within the family as the child grows.1 Couples who already have at least one biological child together and want a child of the opposite sex are eligible to apply.2

Sex selection is possible through a technique known as preimplantation genetic diagnosis (“PGD”)3. PGD has been available since the early 1990s to aid couples with known risk for conceiving a child with a chromosomal abnormality or genetic mutation. Performed in conjunction with in vitro fertilization (“IVF”), PGD enables physicians to identify embryos with chromosomal abnormalities, such as trisomy, and embryos with certain genetic diseases, like hemophilia or muscular dystrophy.4 Embryos that are free from the specific genetic mutation or abnormality are selected for implantation. Since 1990, more than 700 children have been born to couples undergoing PGD and IVF.5

The new study will expand PGD and sex selection to parents who have no medical reason for choosing their child’s sex. Opponents have criticized the study on several grounds. First, the risks associated with PGD and IVF far exceed any benefit stemming from choosing a child’s sex. Second, healthy embryos of the “wrong” sex would likely be destroyed. Third, the cost of the procedures is significant. Fourth, allowing potential parents to choose their child’s sex would merely be a first step. Parents who could afford PGD and IVF could eventually choose other characteristics, including intelligence, beauty, and sexual orientation. Finally, choice of sex necessarily infers that one sex is preferable. Female discrimination is evident in many parts of the world, and in some countries has resulted in an imbalance in the male to female ratio.

In vitro fertilization poses some risks to a woman’s health, to the resulting pregnancy and to the fetus or fetuses. Typically, the hormone gonadotropin is administered to stimulate ovulation, resulting in the production of many ova. Side effects include nausea, breast tenderness, pelvic discomfort, flu-like symptoms, ovarian cysts, and on rare occasions

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2 E-mail from Sallie McAdoo, Genetic Counselor, PGD Program Coordinator, Baylor College of Medicine, to author (Mar. 3, 2006) (on file with author).
3 J. A. Robertson, *Extending Preimplantation Genetic Diagnosis: Medical and Non-Medical Uses*, 29 *Medical Ethics* 213-216. Preimplantation genetic diagnosis is “the technique by which early human embryos are genetically screened for selection for transfer to the uterus.” Id.
5 Robertson, *supra* note 3.
ovarian hyperstimulation syndrome, a potentially life-threatening condition. Next, the ova are collected and fertilized in a laboratory. Most women require anesthesia during the ova retrieval process. Options include general anesthesia, sedation, and local or regional anesthesia. There are risks associated with anesthesia that couples considering in vitro fertilization should consider. After three days, an embryologist performs cell biopsies to determine the sex of each embryo. This involves removing one cell from the embryo. Embryos of the desired sex are then implanted in the woman’s uterus through a process called ova transfer. More than one embryo may be transferred to optimize the chance of a successful pregnancy. Unfortunately, the technique can be “too successful,” resulting in twins, triplets, or more with the associated risks of pre-term birth, low birth weight, and poor neonatal outcomes. In cases where three or more embryos successfully implant in the uterus, physicians may counsel couples to undergo multifetal pregnancy reduction. This is a process by which one or more fetus(es) is aborted to increase the chance that the pregnancy can be carried to a point where the remaining fetus(es) are viable. It is usually performed at 11 to 12 weeks of pregnancy. Deciding whether to abort one or more fetuses for the good of those that remain puts couples in an extremely difficult position.

The fate of embryos that are not selected for implantation raises another ethical issue. Currently there are an estimated 400,000 frozen embryos in frozen storage in the United States. The operation of fertility clinics is largely unregulated in the U.S., raising the potential for ever-increasing numbers of frozen embryos. The question of what to do with these embryos has been hotly debated. Proponents of embryonic stem cell research see them as an opportunity for scientific study. Those with a right-to-life view argue that

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6 Practice Committee of the American Society for Reproductive Medicine, Ovarian Hyperstimulation Syndrome, 80 FERTILITY & STERILITY 1309-14 (Nov. 2003).
8 Landhuis, supra note 4.
9 See generally, A. Malpani et. al., Preimplantation Sex Selection for Family Balancing in India, 17 HUMAN REPRODUCTION 11-12 (Jan 2002).
10 P.G. Crosignani & B.L. Rubin, Multiple Gestation Pregnancy, 15 HUMAN REPRODUCTION 1856, 1863 (2000), available at http://humrep.oxfordjournals.org/cgi/content/full/15/8/1856 (last visited May 6, 2006). The authors prepared this report for the European Society of Human Reproduction & Embryology (“ESHRE”). The report is based on the content of a 1999 meeting that was organized by ESHRE to discuss multiple gestation pregnancy (characterizing multiple gestations as high risk pregnancies, far more likely than single pregnancies to be complicated by maternal hypertension, maternal mortality, early pregnancy loss, prematurity, low birth weight, intrauterine growth restriction, perinatal morbidity and mortality, and developmental complications for survivors, such as cerebral palsy and learning disabilities). Id.
11 Id. at 1860.
12 Id.
13 Id.
14 Id. at 1856.
they should not be destroyed or used for research. An ethicist with Focus on the Family recently voiced the opinion that all embryos created during the IVF process should be implanted. Others suggest that they should be “adopted” by infertile couples. At least one member of Congress, Kansas Senator Sam Brownback, has suggested regulating IVF and limiting the number of embryos produced.

Financial cost makes fetal sex selection an unrealistic option for most parents. One cycle of IVF averages between $6,000 and $12,000. PGD adds around $3,500 to $5,000 to that cost. Where there is a medical reason for IVF and PGD, some of the costs may be covered by health insurance. It is unclear how the expense will be paid when the single reason for the procedures is sex selection. If a couple is in a position to pay for IVF and PGD, another issue is presented. Sex selection may be just the start; eventually wealthy parents might be able to choose other characteristics of their children. The concern is twofold: Genetic engineering could be used to practice gender discrimination, and it may generate very high parental expectations that a child might not be able to meet. Traditionally parents have had no option other than to accept their offspring as they are. One of the qualities society values in parents is the ability to love, accept and nurture their children. This trait would no longer be as important if parents could pick and choose their children’s characteristics.

Finally, gender choice could further discrimination against women and affect the global balance between males and females. In many countries around the world, males have been valued over females for centuries. In China, for example, where female fetuses are selectively aborted, the ratio of males to females has reached 1.20:1. In South Korea, the male to female ratio at birth grew from 1.07 in 1982 to 1.15 in 1991.

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16 Id. (interviewing Robert George, a professor at Princeton University and a member of President Bush’s Council on Bioethics, conceded to CBS 60 Minutes that there are many more frozen embryos than will ever be donated to other couples: “If we cannot encourage more parents to permit the embryos to be adopted, we’re going to be stuck … and the reality will be that those embryos remain in cryo-preservation indefinitely.” Still, in his view, leaving embryos frozen in perpetuity is morally preferable to destroying them for stem cell research.)


18 A Surplus of Embryos, supra note 15.

19 Young, supra note 17.

20 Landhuis, supra note 4.

21 Id.

22 McAdoo, supra note 2. The out-of-pocket cost for participants in the Baylor study will range from “$3,000-$13,000 depending on the couple’s medical and insurance situation.” Id.

23 Kim, supra note 7.


25 Zeng, supra note 24.

26 Benagiano, supra note 24.
disturbing, the ratio for male children born to a couple in succession went from 1.06 for the first child to 2.12 for the fourth. In India, 36 couples participated in preimplantation sex selection for family balancing. Of those couples, all 36 chose to have a male child. Amartya Sen, the 1998 Nobel Prize Laureate in Economics, has calculated that the world is short some 100 million women, due to a variety of discriminations that result in their premature deaths.

While it may be practically possible for couples to select the sex of their offspring, it is unreasonable to permit them to do so using IVF and PGD. The potential risks and adverse consequences associated with these therapies, the costs, the lack of regulatory oversight, the unresolved ethical debate over unused embryos, and the potential for abuse far outweigh any possible gain resulting from sex selection. The new study may provide some answers about how cultural and family values influence couples to undergo expensive and risky therapies in order to choose the gender of their child and how “chosen” children fare within the family. It should not mark the beginning, however, of a trend toward gender selection for all prospective parents.

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28 Malpani, supra note 9.
29 Id.
30 Id. The United Nations Children’s Fund calculated that there are between 40 and 50 million women missing in India. Id. See also United Nations Children’s Fund, Gender Equity: Towards Women’s Empowerment. The Progress of Indian States. UNICEF, New Delhi, India (1996).