ACOG COMMITTEE OPINION

Number 360 • February 2007

Sex Selection*

Committee on Ethics

Reaffirmed 2008

ABSTRACT: In this Committee Opinion, the American College of Obstetricians and Gynecologists' Committee on Ethics presents various ethical considerations and arguments relevant to both prefertilization and postfertilization techniques for sex selection. The principal medical indication for sex selection is known or suspected risk of sex-linked genetic disorders. Other reasons sex selection is requested are personal, social, or cultural in nature. The Committee on Ethics supports the practice of offering patients procedures for the purpose of preventing serious sex-linked genetic diseases. However, the committee opposes meeting requests for sex selection for personal and family reasons, including family balancing, because of the concern that such requests may ultimately support sexist practices. Because a patient is entitled to obtain personal medical information, including information about the sex of her fetus, it will sometimes be impossible for health care professionals to avoid unwitting participation in sex selection.

Sex selection is the practice of using medical techniques to choose the sex of offspring. Patients may request sex selection for a number of reasons. Medical indications include the prevention of sex-linked genetic disorders. In addition, there are a variety of social, economic, cultural, and personal reasons for selecting the sex of children. In cultures in which males are more highly valued than females, sex selection has been practiced to ensure that offspring will be male. A couple who has one or more children of one sex may request sex selection for "family balancing," that is, to have a child of the other sex.

Currently, reliable techniques for selecting sex are limited to postfertilization methods. Postfertilization methods include techniques used during pregnancy as well as techniques used in assisted reproduction before the transfer of embryos created in vitro. Attention also has focused on preconception techniques, particularly flow cytometry separation of X-bearing and Y-bearing spermatozoa before intrauterine insemination or in vitro fertilization (IVF).

*Update of "Sex Selection," in *Ethics in Obstetrics and Gynecology*, Second Edition, 2004.

In this Committee Opinion, the American College of Obstetricians and Gynecologists' Committee on Ethics presents various ethical considerations and arguments relevant to both prefertilization and postfertilization techniques for sex selection. It also provides recommendations for health care professionals who may be asked to participate in sex selection.

Indications

The principal medical indication for sex selection is known or suspected risk of sex-linked genetic disorders. For example, 50% of males born to women who carry the gene for hemophilia will have this condition. By identifying the sex of the preimplantation embryo or fetus, a woman can learn whether or not the 50% risk of hemophilia applies, and she can receive appropriate prenatal counseling. To ensure that surviving offspring will not have this condition, some women at risk for transmitting hemophilia choose to abort male fetuses or choose not to transfer male embryos. Where the marker or gene for a sex-linked genetic disorder is known, selection on the basis of direct identification of affected embryos or fetuses,

The American College of Obstetricians and Gynecologists
Women's Health Care Physicians

rather than on the basis of sex, is possible. Direct identification has the advantage of avoiding the possibility of aborting an unaffected fetus or deciding not to transfer unaffected embryos. Despite the increased ability to identify genes and markers, in certain situations, sex determination is the only current method of identifying embryos or fetuses potentially affected with sex-linked disorders.

Inevitably, identification of sex occurs whenever karyotyping is performed. When medical indications for genetic karyotyping do not require information about sex chromosomes, the prospective parent(s) may elect not to be told the sex of the fetus.

Other reasons sex selection is requested are personal, social, or cultural in nature. For example, the prospective parent(s) may prefer that an only or first-born child be of a certain sex or may desire a balance of sexes in the completed family.

Methods

A variety of techniques are available for sex identification and selection. These include techniques used before fertilization, after fertilization but before embryo transfer and, most frequently, after implantation.

Prefertilization

Techniques for sex selection before fertilization include timing sexual intercourse and using various methods for separating X-bearing and Y-bearing sperm (1–5). No current technique for prefertilization sex selection has been shown to be reliable. Recent attention, however, has focused on flow cytometry separation of X-bearing and Y-bearing spermatozoa as a method of enriching sperm populations for insemination. This technique allows heavier X-bearing sperm to be separated; therefore, selection of females alone may be achieved with increased probability (3). More research is needed to determine whether any of these techniques can be endorsed in terms of reliability or safety.

Postfertilization and Pretransfer

Assisted reproductive technologies, such as IVF, make possible biopsy of one or more cells from a developing embryo at the cleavage or blastocyst stage (6). Fluorescence in situ hybridization can be used for analysis of chromosomes and sex selection. Embryos of the undesired sex can be discarded or frozen.

Postimplantation

After implantation of a fertilized egg, karyotyping of fetal cells will provide information about fetal sex. This presents patients with the option of terminating pregnancies for the purpose of sex selection.

Ethical Positions of Other Organizations

Many organizations have issued statements concerning the ethics of health care provider participation in sex selection. The ethics committee of the American Society for Reproductive Medicine maintains that the use of preconception sex selection by preimplantation genetic diagnosis for nonmedical reasons is ethically problematic and "should be discouraged" (7). However, it issued a statement in 2001 that if prefertilization techniques, particularly flow cytometry for sperm sorting, were demonstrated to be safe and efficacious, these techniques would be ethically permissible for family balancing (8). Because a preimplantation genetic diagnosis is physically more burdensome and necessarily involves the destruction and discarding of embryos, it was not considered similarly permissible for family balancing (9).

The Programme of Action adopted by the United Nations International Conference on Population and Development opposed the use of sex selection techniques for any nonmedical reason (10). The United Nations urges governments of all nations "to take necessary measures to prevent . . . prenatal sex selection."

The International Federation of Gynecology and Obstetrics rejects sex selection when it is used as a tool for sex discrimination. It supports preconception sex selection when it is used to avoid sex-linked genetic disorders (11).

The United Kingdom's Human Fertilisation and Embryology Authority Code of Practice on preimplantation genetic diagnosis states that "centres may not use any information derived from tests on an embryo, or any material removed from it or from the gametes that produced it, to select embryos of a particular sex for nonmedical reasons" (12).

Discussion

Medical Testing Not Expressly for the Purpose of Sex Selection

Health care providers may participate unknowingly in sex selection when information about the sex of a fetus results from a medical procedure performed for some other purpose. For example, when a procedure is done to rule out medical disorders in the fetus, the sex of a fetus may become known and may be used for sex selection without the health care provider's knowledge.

The American College of Obstetricians and Gynecologists' Committee on Ethics maintains that when a medical procedure is done for a purpose other than obtaining information about the sex of a fetus but will reveal the fetus's sex, this information should not be withheld from the pregnant woman who requests it. This is because this information legally and ethically belongs to the patient. As a consequence, it might be difficult for health care providers to avoid the possibility of unwittingly participating in sex selection. To minimize the possibility that they will unknowingly participate in sex selection, physicians should foster open communication with patients aimed at clarifying patients' goals. Although

health care providers may not ethically withhold medical information from patients who request it, they are not obligated to perform an abortion, or other medical procedure, to select fetal sex.

Medical Testing Expressly for the Purpose of Sex Selection

With regard to medical procedures performed for the express purpose of selecting the sex of a fetus, the following four potential ethical positions are outlined to facilitate discussion:

Position 1: Never participate in sex selection. Health care providers may never choose to perform medical procedures with the intended purpose of sex selection.

Position 2: Participate in sex selection when medically indicated. Health care providers may choose to perform medical procedures with the intended purpose of preventing sex-linked genetic disorders.

Position 3: Participate in sex selection for medical indications and for the purpose of family balancing. Health care providers may choose to perform medical procedures for sex selection when the patient has at least one child and desires a child of the other sex.

Position 4: Participate in sex selection whenever requested. Health care providers may choose to perform medical procedures for the purpose of sex selection whenever the patient requests such procedures.

The committee shares the concern expressed by the United Nations and the International Federation of Gynecology and Obstetrics that sex selection can be motivated by and reinforce the devaluation of women. The committee supports the ethical principle of equality between the sexes.

The committee rejects, as too restrictive, the position that sex selection techniques are always unethical (position 1). The committee supports, as ethically permissible, the practice of sex selection to prevent serious sex-linked genetic disorders (position 2). However, the increasing availability of testing for specific gene mutations is likely to make selection based on sex alone unnecessary in many of these cases. For example, it supports offering patients using assisted reproductive techniques the option of preimplantation genetic diagnosis for identification of male sex chromosomes if patients are at risk for transmitting Duchenne's muscular dystrophy. This position is consistent with the stance of equality between the sexes because it does not imply that the sex of a child itself makes that child more or less valuable.

Some argue that sex selection techniques can be ethically justified when used to achieve a "balance" in a family in which all current children are the same sex and a child of the opposite sex is desired (position 3). To achieve this goal, couples may request 1) sperm sorting by flow cytometry to enhance the probability of achieving a pregnancy of a particular sex, although these techniques are considered experimental; 2) transferring only embryos of one sex in assisted reproduction after embryo biopsy and preimplantation genetic diagnosis; 3) reducing, on the basis of sex, the number of fetuses in a multifetal pregnancy; or 4) aborting fetuses that are not of the desired sex. In these situations, individual parents may consistently judge sex selection to be an important personal or family goal and, at the same time, reject the idea that children of one sex are inherently more valuable than children of another sex.

Although this stance is, in principle, consistent with the principle of equality between the sexes, it nonetheless raises ethical concerns. First, it often is impossible to ascertain patients' true motives for requesting sex selection procedures. For example, patients who want to abort female fetuses because they value male offspring more than female offspring would be unlikely to espouse such beliefs openly if they thought this would lead physicians to deny their requests. Second, even when sex selection is requested for nonsexist reasons, the very idea of preferring a child of a particular sex may be interpreted as condoning sexist values and, hence, create a climate in which sex discrimination can more easily flourish. Even preconception techniques of sex selection may encourage such a climate. The use of flow cytometry is experimental, and preliminary reports indicate that achievement of a female fetus is not guaranteed. Misconception about the accuracy of this evolving technology coupled with a strong preference for a child of a particular sex may lead couples to terminate a pregnancy of the "undesired" sex.

The committee concludes that use of sex selection techniques for family balancing violates the norm of equality between the sexes; moreover, this ethical objection arises regardless of the timing of selection (ie, preconception or postconception) or the stage of development of the embryo or fetus.

The committee rejects the position that sex selection should be performed on demand (position 4) because this position may reflect and encourage sex discrimination. In most societies where sex selection is widely practiced, families prefer male offspring. Although this preference sometimes has an economic rationale, such as the financial support or physical labor male offspring traditionally provide or the financial liability associated with female offspring, it also reflects the belief that males are inherently more valuable than females. Where systematic preferences for a particular sex dominate (13, 14), there is a need to address underlying inequalities between the sexes.

Summary

The committee has sought to assist physicians and other health care providers facing requests from patients for sex

selection by calling attention to relevant ethical considerations, affirming the value of equality between the sexes, and emphasizing that individual health care providers are never ethically required to participate in sex selection. The committee accepts, as ethically permissible, the practice of sex selection to prevent sex-linked genetic disorders. The committee opposes meeting other requests for sex selection, such as the belief that offspring of a certain sex are inherently more valuable. The committee opposes meeting requests for sex selection for personal and family reasons, including family balancing, because of the concern that such requests may ultimately support sexist practices.

Medical techniques intended for other purposes have the potential for being used by patients for sex selection without the health care provider's knowledge or consent. Because a patient is entitled to obtain personal medical information, including information about the sex of her fetus, it will sometimes be impossible for health care professionals to avoid unwitting participation in sex selection.

References

1. Gray RH. Natural family planning and sex selection: fact or fiction? Am J Obstet Gynecol 1991;165:1982–4.
2. Check JH, Kastoff D. A prospective study to evaluate the efficacy of modified swim-up preparation for male sex selection. Hum Reprod 1993;8:211–4.
3. Fugger EF, Black SH, Keyvanfar K, Schulman JD. Births of normal daughters after MicroSort sperm separation and intrauterine insemination, in-vitro fertilization, or intracytoplasmic sperm injection. Hum Reprod 1998;13:2367–70.
4. Michelmann HW, Gratz G, Hinney B. X-Y sperm selection: fact or fiction? Hum Reprod Genet Ethics 2000; 6:32–8.
5. Schulman JD, Karabinus DS. Scientific aspects of preconception gender selection. Reprod Biomed Online 2005;10 (suppl 1):111–5.
6. Sermon K, Van Steirteghem A, Liebaers I. Preimplantation genetic diagnosis. Lancet 2004;363:1633–41.
7. Sex selection and preimplantation genetic diagnosis. Ethics Committee of the American Society for Reproductive Medicine. Fertil Steril 2004;82 (suppl):S245–8.
8. Preconception gender selection for nonmedical reasons. Ethics Committee of the American Society for Reproductive Medicine. Fertil Steril 2004;82(suppl):S232–5.
9. Robertson J. Sex selection: final word from the ASRM Ethics Committee on the use of PGD [news]. Hastings Cent Rep 2002;32(2):6.
10. United Nations. Gender equality, equity and empowerment of women. In: Population and development: programme of action adopted at the International Conference on Population and Development, Cairo, 5–13 September 1994. New York (NY): UN; 1995. p. 17–21.
11. Ethical guidelines on sex selection for non-medical purposes. FIGO Committee for the Ethical Aspects of Human Reproduction and Women's Health. Int J Gynaecol Obstet 2006;92:329–30.
12. Human Fertilisation and Embryology Authority. Code of practice. 6th ed. London: HFEA; 2003.
13. Jha P, Kumar R, Vasa P, Dhingra N, Thiruchelvam D, Moinedin R. Low female [corrected]-to-male [corrected] sex ratio of children born in India: national survey of 1.1 million households [published erratum appears in Lancet 2006;367:1730]. Lancet 2006;367:211–8.
14. Hesketh T, Lu L, Xing ZW. The effect of China's one-child family policy after 25 years. N Engl J Med 2005;353:1171–6.

Copyright © February 2007 by the American College of Obstetricians and Gynecologists, 409 12th Street, SW, PO Box 96920, Washington, DC 20090-6920. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, posted on the Internet, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the publisher. Requests for authorization to make photocopies should be directed to: Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400

Sex selection. ACOG Committee Opinion No. 360. American College of Obstetricians and Gynecologists. Obstet Gynecol 2007;109:475–8.

ISSN 1074-861X