Gender Selection: Cultural and Religious Perspectives

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Objective: To review the current developments in the field of preconceptual sex selection and to discuss the cultural and religious perspectives as that accompany the scientific progress.

Design: A survey of the major publications in Judaism, Christianity and Islam regarding the issue of gender selection. Examination of current methods of preconceptual gender selection revealed that in vivo methods such as timing of intercourse, the use of ovulation induction medications, and artificial insemination do not appear to affect the sex ratio to a clinically significant degree. In vitro separation of X- and Y-bearing spermatozoa by gradient techniques have been reported to alter significantly the sex ratio at birth. However, these trials were not controlled, and molecular biological techniques could not validate that these methods indeed change the Y- to X bearing spermatozoa ratio sufficiently for clinical use. Nevertheless recent scientific advances have made highly reliable preconceptual sex selection possible by using preimplantation diagnosis (PGD) or sperm separation by flow cytometry combined with AIH or IVF. At present, these methods have been used to avoid sex-linked disorders. Both involve the invasive procedure of IVF and thus are held by most as inappropriate for nonmedical indications. However, improvement in flow cytometry output of sexed spermatozoa might provide in the near future sufficient sorted gametes for artificial insemination. It may be that in the near future, an improvement in flow cytometry output of sexed spermatozoa will provide sufficient sorted gametes for artificial insemination. In such a case, the medical community will be forced to take a stand, whether this reliable noninvasive method of sexing will be allowed for social purposes and even if the practice of PGD should be allowed for nonmedical indications.

Conclusion: The requirement for a man to procreate by having a minimum of two children—a boy and a girl—is obligatory according to Jewish law. According to both schools, Beit Shamai and Beit Hillel, in order to fulfill the obligation of procreation at least one son is required. Therefore the application of sex preselection for nonmedical indications may be of practical importance using the method of sperm separation or sex selection of pre-embryo by PGD. According to Christian view, especially the one of the Catholic Church, gender preselection even for medical indications is forbidden. Islamic legal viewpoint is that fetal sex selection is lawful when it is practiced on an individual basis, to fulfill the wish of a married couple to have a boy or a girl through available medical means.

KEY WORDS: Religion and human reproduction; preimplantation diagnosis; sex preselection; sperm separation.

INTRODUCTION

Interest in sex preselection has its roots in ancient cultures (1). The Egyptians believed that women of a greenish cast of complexion were “certain to

have boys.” The early Greeks believed that tying off the left testicle would produce boys because male-determining sperm were derived from the right testicle. Aristotle gave advice on positions for sexual intercourse, and desirable diet for the mother. Hippocrates deduced that male and female children developed in different parts of the uterus. In the Jewish tradition, the Talmud suggests that the determination of sex

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takes place at the moment of copulation. When the woman emits her semen before the man, the child will be a boy. Otherwise it will be a girl. Talmud said that placing the marriage bed in a north-south direction favors the conception of boys. Rabbi Ammi stated: If the woman emits her semen first she bears a male child; if the man emits his semen first she bears a female child; for it is said: If a woman emits semen and bears a manchild (2). At first it used to be said that if the woman emits her semen first she will bear a male, and if the man emits his semen first she will bear a female, but the sages did not explain the reason, until Rabbi Zadok came and explained it: These are the sons of Leah, whom she bore unto Jacob in Paddan, Aram with his daughter Dinah (3). Scripture thus ascribes the males to the females (i.e., sons of Leah) and the females to the males (i.e., his daughter Dinah).

And the sons of Ulam were mighty men of valor, archers, and had many sons, and sons' sons (4). Now is it within the power of man to increase the number of sons and sons' sons? But the fact is that because they contained themselves during intercourse, in order that their wives should emit their semen first, so that their children should be males, Scripture attributes to them the same merit as if they had themselves caused the increase of the number of their sons and sons' sons. This explains what Rabbi Kattina said: "I could make all my children to be males." A statement in the Talmud pronounced "he who desires all his children to be males should cohabit twice in succession." (5). This advice to the husband to repeat the coital act in order to increase the chance of a male birth is explained by Rabbi Rashi, that during the second intercourse the woman will certainly "emit seed first." That is if she did not reach orgasm first and did not conceive with the first ejaculation. She may be impregnated as a result of the second intercourse during which she should be allowed to reach orgasm first. Talmudic passage states, what should a man do that he may have male children? He should marry a wife that is worthy of him, and conduct himself in modesty at the time of marital intercourse.

The Talmud raises the question of what happens if both man and woman emit seed simultaneously. Several possible answers are given: the offspring may be a hermaphrodite, one whose sex is unknown (*tumtum*), or twins, one male and one female (6).

French aristocrats of the eighteenth century are said to have had their left testicles removed so as to be sure of an heir (male). The French ensured the conception of males by reciting chants or by lying on one particular side while having sexual intercourse, by wearing

boots to bed, by waiting for a certain phase of the moon or a rising tide, or by eating certain food. Several scientists prescribed special diets methods as a means of conceiving males (1). One custom suggested by Pacific Island women was dressing in men's clothes in order to conceive sons, and men in the United States believed that hanging their underpants on the right side of the bed conceived a male and the left side for a female.

IN VIVO AND IN VITRO METHODS

During the present century, interest has focused mainly on vivo methods of preconceptional gender selection such as timing of intercourse, the use of ovulation induction medications, and artificial insemination. Those methods do not appear to affect the sex ratio to a clinically significant degree. In vitro separation of X- and Y-bearing spermatozoa by gradient techniques have been reported to alter significantly the sex ratio at birth (7). However, these trials were not scientifically controlled, and molecular biological techniques could not validate that these methods indeed change the Y- to X-bearing spermatozoa ratio sufficiently for clinical use. Nevertheless recent scientific advances have made highly reliable preconceptional sex selection possible by using preimplantation diagnosis or sperm separation by flow cytometry combined with AIH and/or IVF. At present, these methods have been used to avoid sex-linked disorders. Both involve the invasive procedure of IVF and thus are held by most as inappropriate for nonmedical indications. However, improvement in flow cytometry output of sexed spermatozoa might provide in the near future sufficient sorted gametes for artificial insemination. This technique then will provide an available noninvasive method of sexing for social purposes (7).

The religious perspectives of sexing for social purposes will be analyzed in the present review.

JUDAISM-HALACHA (8)

A strict association between faith and practical ruling characterizes the Jewish religion. In principal Jewish law has two divisions, written and oral. The foundation of the written law and the origin of authority is the Torah, the first five books of the Scripture. It is an expression of God's revelation reaching and guiding humanity. The Torah is viewed as a single unit, a divine text that includes moral values as well as practical laws. The oral laws interpret, expand, and elucidate the written Torah and regulate new rules and customs.

Its authority is derived from the written Torah. The dominant parts of the oral law are as follows:

1. Mishnah. Numerous scholars compiled an early textbook systematically over a few centuries. Its final form was established early in the third century. The Mishnah includes early traditional and original interpretations of the written Torah, ancient regulations that are not written in the Torah, and post-Bible regulations.
2. Talmud. For approximately three centuries after the final compilation of the Mishnah, the great interpreters studied the six orders to the Mishnah and wrote a monumental composition called Talmud.
3. Post-Talmudic codes. After the compilation of the Talmud, an enormous amount of Talmudic knowledge was essential for efficient ruling. These post-Talmudic codes came to the world with the intention of assisting access to the laws, regulations, and customs of the Talmudic Halacha. Different scholars until the sixteenth century summarized and reviewed the Halachic conclusions of the Talmud in the post-Talmudic Codes. Among the scholars were Rashi (1040–1105), Rabbi Moshe Ben Nachman (1195–1270), and Rabbi Menahem Ben Shalom Hameiri (1249–1316).
4. Responsa. The various attitudes of rabbinical scholars about the way religion should be applied in the changing world is analyzed and discussed with regard to the legal codes, and written opinion is given by qualified authorities to questions about aspects of Jewish law. Responsa is the term usually confined to written replies given to questions on all aspects of Jewish law by authorities from the time of the later Geonim to the present day. About 1000 volumes, containing more than half a million separate Responsa, have appeared in print.

The application of new technology according to Jewish law is based on the following principles: The Mishnah emphasizes that only prohibitive, strict decisions require juridical substantiation while permissibility or leniency needs no supportive precedent. The absence of a prohibitive substantiation is to be equated with halachic permissibility. This implies that any technological innovation is permissible unless there is a halachic reason for prohibiting it.

In order to be sure that there is no halachic prohibition against a new procedure, an accepted halachic authority must be consulted. Jewish law differentiates between the authority to abrogate a temporary prohibition and the authority to determine permanent permissibility. Faced with uncertainty or insufficient information, one is entitled to be strict with oneself; no special authority is needed for prohibition by the individual. On the other hand, in order to establish permissibility, there must be unequivocal information. When there is no clear precedent in halacha to decide the issue at hand, one must be thoroughly versed in all halachic sources before definitely confirming that no halachic reason for prohibition exists.

There are well-known halachic rules for deciding controversial issues. If, for example, there is a doubt in a matter prohibited by the Torah, the ruling is prohibitive; if the doubt is related to a rabbinical ruling the decision is usually permissive.

REPRODUCTION AND HALACHA

Jewish attitudes toward infertility can be discerned from the fact that the first command from God to Adam was, "Be fruitful and multiply." This is expressed in the Talmudic saying from the second century, "Any man who has no children is considered as a dead man." This attitude arises from the Bible itself and refers to the words of Rachel, who was barren: "Give me children or else I die."

A rabbinic disagreement in the Mishnah deals with the number of children required to fulfill the divine command of procreation (9). It would have been impossible for the human race to propagate had not one of each sex been created. For the preservation of the race, however, it is necessary for every man to have children of *both* sexes. With two males, a man has not fulfilled the mitzvah of "be fruitful and multiply." So how is it possible to explain that it is written that in order to fulfil the obligation of "pru and rvu" you need to have two male children.

The Gemara explains that they learn this from Moses, who only had two sons (I Chron. 23:15), and withdrew from his wife.

Beit Hillel says, a male and a female, as it is written, "Male and female He created them" (Gen. 5:2.)—which they learn from the creation of the world, as it is written—regarding Adam and Eve "Male and female He created them"—and just as male and female were created, so is it necessary to fulfill the mitzvah of "be fruitful and multiply" by begetting a male and a female.

Their view was based on God's creation of the rib, with Adam and Eve as the first humans. It would have been impossible for the human race to propagate had not one of each sex been created. For the preservation of the race, however, it is not necessary for every man to have children of both sexes. As in most cases, Talmudic preference is in accord with the Hilled School (10).

Man is commanded to be "fruitful and multiply," but not woman. (10).

Although a man who accomplishes the basic command of procreation is not committed by the Torah to continue to procreate he is obligated to be married and not live in celibacy. Along these lines, the Mishnah raises an interesting question: Does the demand to procreate rest equally on men and women, or is it exclusive obligation of men while women who bear all of the risk of childbearing bear no responsibility? Rabbi Yohanan ben Beroka says, Regarding both it states, "And God blessed them, and God said to them: 'Be fruitful and multiply'" (Gen. 1:28).

According to both Schools, Beit Shammai and Beit Hillel in order to fulfill the obligation of procreation at least one son is required. Therefore the application of presex selection may be of practical importance using the method of sperm separation or sex selection of preembryo (PGD).

SPERM SEPARATION AND AIH

Preconception sex selection has generated great interest and controversy over the years. Examination of current methods of preconceptual gender selection revealed that in vivo methods such as timing of intercourse, the use of ovulation induction medications, and artificial insemination do not appear to affect the sex ratio to a clinically significant degree. In vitro separation of X- and Y-bearing spermatozoa by gradient techniques have been reported to alter significantly the sex ratio at birth (11). Flow cytometry is the only technique that produces a clinically enrichment of X- or Y- bearing spermatozoa (7). However, concern has been raised about the methodological implications of the flow technique because of the use of DNA stains and UV light. Births of normal daughters after sperm separation and intrauterine insemination, in-vitro fertilization, or intracytoplasmic sperm injection was already achieved. Offspring was of the desired female gender in 92.9% of the pregnancies that were obtained after use of flow cytometric separated human sperm cells (MicroSort) for preconcep-

tion gender selection. Most of these pregnancies and births were achieved after simple intrauterine insemination(12). However, improvement in flow cytometry output of sexed spermatozoa might provide in the near future sufficient sorted gametes for artificial insemination.

PREIMPLANTATION SEX DETERMINATION

In vitro fertilization techniques, which were developed originally for the treatment of infertility, recently have been combined with new technologies that allow gender determination of IVF embryos and selective transfer of the desired male or female embryos (13,14). The main objectives of PGD include an effort to offer the widest possible range of choices to women at risk of having children with genetic abnormalities, to provide reassurance, and reduce the anxiety associated with reproduction.

These objectives are especially for women at high risk; and to enable women at high risk to continue a pregnancy by confirming the absence of certain genetic diseases. The emphasis is placed on the provision of life for new children who may otherwise never have been born.

The advantage that enhances the acceptance of PGD by social groups is that it avoids the implantation of defected embryos, and this process of selection eliminates the need for future termination of pregnancy. PGD avoids all the debates related with the issue of abortion in society and in individual cases, reduces or prevents the suffering for the affected family, fetus, and society and also protects the society's resources (15). One of the goals of PGD is to enhance the couple's ability to make informed reproductive decisions, even though sometimes such a decision is influenced by pressure applied by society.

Preimplantation gender selection, another issue of social conflict, is already practiced in some centers. Gender selection can be used in order to avoid the almost 300 X-linked recessive diseases that are known today. So far, sex selection in preimplantation embryos has been reported only for the avoidance of X-linked disease, carried by the mother, by the selection of female embryos for transfer. In this approach, after traditional IVF, a biopsy of one or two blastomeres from each of the cleavage stage 3-day-old embryos provides the material for gender determination by single genome DNA analysis. The genetic diagnosis is carried out within the day of embryo biopsy, allowing selected embryos to be transferred

the same evening. In vitro development of human embryos to a blastocyst does not appear to be affected adversely by a one- to two-cell biopsy at the eight-cell stage and pregnancy rates appear to be unaffected, as long as embryos are transferred on the same day. Currently, two methods are used for gender preimplantation diagnosis: either polymerase chain reaction (PCR) amplification of DNA from the biopsied blastomeres, or cytogenetic preparation of the single blastomeres for fluorescence in situ hybridization (7). Gender determination by PCR amplification of a specific sequence derived from the Y chromosome was used in the first clinical trials. This approach led to successful pregnancies after the transfer of fern embryos to mothers who were carriers of serious linked disorders (14).

An alternative method of sex preselection human embryos is by dual fluorescence in situ hybridization for simultaneous detection of X- and Y-chromosome-specific sequences. It allows simultaneous detection of the X and Y chromosomes each in a different color. The major advantage dual fluorescence in situ hybridization over PCR is that it can assess the ploidy of the gonosomes. Mosaicism and aneuploidy such as XO and XXX have been detected using dual fluorescence in situ hybridization, and the transfer of such abnormal embryos was avoided. Thus, fluorescence in situ hybridization is considered the method of choice for preimplantation human embryo sexing. Family balancing through PGD remains an issue of debate. The subject raises such concerns and emotions that people generally have very polarized views: those wanting complete freedom to choose however they please the sex of their child and those that demand the total prohibition of sex selection for nonmedical purposes. The objection to sex selection arises from the examples of countries such as China, Korea, and the Middle East, in which boys are highly prized for economic, hereditary, or religious/cultural reasons. The financial hardship of raising girls in some of these countries has led to the abandonment of female children and the widespread use of abortion and infanticide in favor of boys, and this would ultimately alter the established sex ratio (16).

HALACHA AND AIH

There is near unanimity of opinion that therapeutic insemination with a husband's sperm (AIH) is permissible according to Jewish Law, halacha, if no

other method will allow the wife to become pregnant (17). However, certain qualifications do exist. First, the couple must have attempted conception for a reasonable period of time 5–10 years and medical proof must exist of the absolute necessity for AIH. Second, according to many authorities, insemination may not be performed while the woman is in Niddah. The halakhot (religious laws) surrounding a woman's menstrual cycle form the basic backdrop for this discussion because they govern the normal sexual life of a religiously committed Jewish couple (8). Understanding their basic concepts is indispensable to professionals providing fertility therapy to an observant couple. A menstruating woman is called Niddah in the Bible and in the Talmudic and post-Talmudic literature. As long as she is within the status of Niddah sexual contact with her is forbidden. The Bible differentiates Niddah menses, and Zavah, dysfunctional uterine bleeding. In the case of Niddah, the duration of menstrual prohibition is 7 days, even if the bleeding is of much shorter duration. A ritual bath (Mikveh) is required to revert Niddah back to the regular status. In the case of Zavah, Mikveh is required after a period of 7 entirely "clean" days (Shivaah Nekeim). The laws concerning Niddah are some of the most fundamental principles of the halachic system, and the historical development of the relevant tracts through the centuries is also extremely complicated (17).

Most rabbis allow sperm to be obtained from the husband both for analysis and insemination, but opinions differ about the best method of procuring them. Masturbation should be avoided if at all possible, coitus interruptus and the use of a special condom are preferred. Artificial insemination of the husband's sperm is generally regarded as a halachically permissible procedure through which paternity can be established and also for the mitsvah of *peru u-revu* "be fruitful and multiply." The biblical obligation to have children or at least *la-shevet* "to be inhabited," this rabbinical obligation to have children can thus be fulfilled.

In conclusion flow cytometry that produces a clinical enrichment of X- or Y-bearing spermatozoa can be applied for sex preselection according to Halacha.

PRECONCEPTION SEX SELECTION AND IVF-ET

The various aspects of the "test tube baby" are of considerable interest in Responsa literature. The basic

fact that allows IVF-ET to be considered in the rabbinical literature at all is that the oocyte and the sperm originate from the wife and husband based on the commandment of procreation stated in the Bible.

What are some of the delineating factors that would nevertheless withhold Jewish law from allowing IVF-ET? Some individual rabbis take a strict position and suggest that legal and biologic ties be severed with the removal of the egg. The fact that the host environment is sustained by means of medical intervention, that is, culture media, could change the biologic and legal status of the child. The majority Jewish religious point of view, however, formulated by the chief Rabbis of Israel, one of the Ashkenazi sectors (European origin) and one of the Sephardim sector (Oriental origin), supports both IVF and ET (18).

By and large most *poskim*, written replies given to questions on all aspects of Jewish law by authorities of Jewish law, have assimilated IVF to AIH and have permitted its utilization. Virtually all contemporary *poskim* have concluded, first, that the egg and sperm providers do have a parental relationship with the IVF generated offspring; second, that the procedure, if undertaken for procreation by an otherwise infertile couple does not violate the prohibition against *hashhatat zera* [wasting sperm/seed]; third, that one may fulfill, through any resulting offspring, either the mitzvah of *peru u-revu* [the biblical obligation to have children], or at the very least, the “lesser” mitzvah of *la-shevet* [the rabbinic obligation to have children].

Thousands of Jewish children have been born as a result of IVF procedures in Israel, many of them to very religious couples.

Jews living outside Israel are generally subjected to the laws of the country in which they live, except when they wish or are required to obey the Jewish traditional personal-status regulations. In such cases, local rabbinical authorities apply rules applicable in the State of Israel when such exist and are recognized.

Therefore preconception sex selection by using sperm separation by flow cytometry combined with IVF can be applied.

PREIMPLANTATION SEX DETERMINATION AND HALACHA

Preimplantation sex determination technique allows gender determination of IVF embryos and selective transfer of the desired male or female embryos. This reliable medically assisted sex selection does not

involve abortion or infanticide, but the post conceptual genetic diagnosis and implantation method would involve infanticide on an embryonic level. If a couple were to choose implantation of embryos that are of one sex, what would happen to the embryos of the opposite sex? They would be discarded. Discarding an embryo, infanticide on an embryonic level is not morally acceptable in the minds of many and doing so violates the right of the discarded embryo to live.

The fetus is not considered a person (Hebrew *Nefesh*, “soul”) until it is born. It is regarded as a part of the mother’s body and not a separate being until it begins to egress from the womb during parturition. In fact, until 40 days after conception, the fertilized egg is considered mere fluid (19,20). The Judeo-biblical tradition does not grant moral status to an embryo before forty days of gestation. Such an embryo has the same moral status as male and female gametes, and its destruction prior to implantation is of the same moral import as the “wasting of human seed.” After 40 days—the time of “quickening” recognized in common law—the implanted embryo is considered to have humanhood, and its destruction is considered an act of homicide. Abortion on demand is repulsive to the ethics of the Halacha; however, in many situations a pregnancy may be terminated. If the mother’s life is in danger, each fetus is a *Rodef* an aggressor who may (or must) be killed to save the individual in danger. Rabbi Eliyashuv, possibly the most influential *posek* in Israel today, has permitted PGD and destruction of affected zygotes to prevent cases of Fragile-X and even in a case of a woman with neurofibromatosis who only had skin lesions. Rabbi Feinstein has taken a similar view as to the permissibility of discarding “extra” preembryos. Preimplantation diagnosis, which is already accepted by some Rabbinic authorities, is likely to be acceptable to most Jewish legal experts when used to prevent serious diseases in offspring. Although the Halachah generally takes a conservative approach regarding abortion, many contemporary rabbinical decisions maintain that untransplanted embryos have no standing and may be discarded. Therefore, screening for genetic diseases is permitted.

The requirement for a man to procreate by having a minimum of two children—a boy and a girl is obligatory according to Jewish law. According to both schools, Beit Shammai and Beit Hillel in order to fulfill the obligation of procreation at least one son is required. Therefore the above analysis shows that the application of presex selection may be of practical

importance using the method of sperm separation or sex selection of preembryo (PGD).

CHRISTIANITY AND REPRODUCTION (21)

Christianity is centered on Jesus, the Son of God and His supreme revelation. Christian beliefs are based on His teachings, as reported in the four officially accepted Gospels and on the Jewish Scriptures, which Christians call the Old Testament. Christianity comprises three principle divisions: the Roman Catholic Church, Protestant churches, and Orthodox Churches. Christianity is characterized by its universality and the command given by Jesus to proclaim the Gospel to all humanity. The most striking development in the evolution of Christianity from its Jewish origin has been the transition from a national religion (of the Jewish nation) to a universal religion.

Issues of sexuality, marriage, and parenthood are central to Christian values. In particular the Catholic Church intervention in the field of reproduction is inspired by the love it feels for humans, helping them to recognize and respect their rights and duties. Christianity, like other intersociety religions, is characterized by a great diversity of sects. It is difficult to find common elements, other than origin and the acceptance of common sacred writings and symbols among all Christian sects. There is, however, a core of common principles within the early Christian movement the western medieval church, and the modern Roman Catholic and major Protestant churches. But in so far as a core of European Christian principles exists, its relations to fertility are largely indirect and cannot easily be formulated. According to Roman Catholic Instruction suffering of spouses who cannot have children or who are afraid of bringing a handicapped child into the world is a suffering that everyone must understand and properly evaluate. The desire for a child is natural: it expresses the vocation to fatherhood and motherhood inscribed in conjugal love. This desire can be even stronger if the couple is affected by sterility, which appears incurable. Nevertheless, marriage does not confer upon the spouses the obligation to have a child, but only the right to perform those natural acts, which are per se ordered to procreation.

The child is not an object to which one has a right, nor can he be considered as an object of ownership: rather, the most gratuitous gift of marriage, and is a living testimony of the mutual giving of his parents. For this reason, the child has the right, as already mentioned, to be the fruit of the specific act of the conjugal love of his parents; and he also has the right

to be respected as a person from the moment of his conception.

ROMAN CATHOLIC CHURCH AND ASSISTED REPRODUCTION

The Vatican statement on assisted reproduction is very clear: Assisted reproduction is not accepted. In 1956, Pope Pius XII declared that attempts at artificial human fecundation in vitro must be rejected as immoral and absolutely unlawful. The church argues that IVF separates human procreation from sexual intercourse.

The Vatican's instruction on respect for human life made an important contribution to discussion on the practice of new reproductive technologies. It was issued by the Congregation for the Doctrine of the Faith in February 1987, signed by Cardinal Joseph Ratzniger, and approved by Pope John Paul II (22). The document is a response to inquiries from Episcopal conferences and individual bishops about the right of interventions into human reproduction. The key value in the instructions is respect for the dignity of the human person. The criteria for evaluating these interventions are the respect defense, and promotion of a human being and his or her primary and fundamental right to life and dignity as a person who is endowed with a spiritual soul and with moral responsibility.

Fertilization is licit when it is the result of a conjugal act, that is, sexual intercourse between husband and wife. From the moral point of view, procreation is deprived of its proper perfection when it is not desired as a result of the conjugal act, that is, the specific act of the spouses' union.

The instruction is quite clear in its judgment on reproductive technology. Although augmented by modern concepts of human dignity and moral rights, this position relies heavily on the traditional natural-law analysis that intercourse has inseparable procreative and unitizes dimensions. There can be absolutely no separation of any dimension of any aspect of reproduction. Consequently, the instruction prohibits IVF-ET, surrogate motherhood, and cryopreservation of embryos.

The instruction rejects AIH and IVF on the grounds that they involve a separation between "the goods and meanings of marriage," that is, the unitize and the procreative. Separation of these two dimensions means that procreation thus achieved is "deprived of its proper perfection" and is therefore "not in conformity with the dignity of the person." A child must be

conceived through an act of love and, indeed of sexual intercourse.

Within marriage AIH cannot be accepted except for situations in which the procedure is not a substitute for the conjugal act but facilitates it so that the act attains its natural purpose. Therefore in vitro separation of X- and Y-bearing spermatozoa by gradient techniques or flow cytometry is unacceptable. "The moral relevance of the link between the meanings of the conjugal act and between the goods of marriage, as well as the unity of the human being and the dignity of his origin, demand that the procreation of a human person be brought about as the fruit of the conjugal act specific to the love between spouses" (22).

The Eastern Orthodox Church supports medical and surgical treatment of infertility. However, IVF and other assisted reproductive technologies are absolutely rejected. The Baptist, Methodist, Lutheran, Mormon, Presbyterian, Episcopal, United Church of Christ, Christian Science, Jehovah's Witness, and Mennonite denominations have liberal attitudes toward infertility treatments. All denominations except Christian Sciences accept IVF with spouse gametes and no embryo wastage. Christian Science poses no objection to AIH but oppose IVF because of use of drugs and surgical procedures. Assisted reproductive technology was developed in Great Britain and Australia. The Anglican Church is liberal on the use of IVF-ET and allows semen collection by means of masturbation for artificial insemination by the husband for IVF. However, it forbids the use of donor gametes, semen or oocyte, from a third party (21).

CHRISTIANITY AND PREIMPLANTATION GENDER SELECTION

The Vatican statement opposed preimplantation diagnosis, "the Church remains opposed from the moral point of view to homologous in vitro fertilization. Such fertilization is in itself illicit and in opposition to the dignity of procreation and of the conjugal union, even when everything is done to avoid the death of the human embryo"(22).

This reliable medically assisted sex selection by PGD would likely involve infanticide on an embryonic level. If a couple were to choose implantation of embryos that are of one sex, what would happen to the embryos of the opposite sex? They would be discarded. Discarding an embryo, infanticide on an embryonic level is not morally acceptable by Christianity and doing so violates the right of the discarded embryo to live. The long tradition of Christianity and

mainly of the Catholic Church is that human life begins at conception and, therefore any use or destruction of preembryo that optimized the opportunity of birth, seriously discounts human life.

In conclusion, gender selection according to Christianity is forbidden.

ISLAM (21,23)

Islam founded about 1400 years ago by the Prophet Muhammad (A.C. 700–632). He was born in Mecca and spent his early life as a merchant. In middle life an inner conviction dawned on him that he was the prophet chosen by Allah to convey eternal messages to the Arabs.

There are two broad subdivisions of Islam-Shi'ism and Sunnis. Shi'ism originally referred to the partisans (Shia) of Ali and over the centuries developed its own body of law. This differed in minor ways (inheritance and the status of women) from that of the majority of Sunnis.

Islamic law, Sharia, is the heart of Islamic religion, it defines the path in which God wishes humans to walk. It not only deals with matters of religious ritual but also regulates every aspect of political, social, and private life. The main roots from which it is derived are the Quran and the Hadith, the tradition of the Prophet Muhammad. The Sharia is binding primary for Muslims, who are directly responsible for God, and it is not enforced by the state. According to orthodox Muslims, the law is founded in divine revelation, and since revelation ended with the death of Muhammad the Sharia is immortal.

There are two sources of Sharia in Islam, Primary and Secondary. The following are Primary sources of Sharia in chronological order:

1. The holy Quran. The word of God.
2. The Sunna (customs). Authentic tradition and sayings of the Prophet Muhammad, collected by specialists in Hadith (tradition).
3. Ijma (consensus). The consensus of the community of believers, who, according to a saying of the Irophen would not agree on any error.
4. Quays (analogy). The application of a decision of the past or the principles on which new questions are based The intelligent reasoning with which to rule on events the Quran and Sunna do not mention.

Good Muslims resort to Secondary sources of Shiria, matters not dealt with in the Primary sources.

The Sharia classifies all human actions without exception into one of Five categories. The Sharia is not rigid; it leaves room to adapt to emerging situations in different eras and places. It can accommodate different honest opinions, as long as they do not conflict with the spirit of its Primary sources and are directed to the benefit of humanity.

Muslim modernists however have proclaimed the right of every qualified person to examine the sources of the Sharia. The result is that in most Muslim countries today, the Sharia laws are restricted and dominate only personal affairs.

Even in personal matters, a great deal of attention is now given to ways of adapting Islamic law to modern life. The Muftis and Cadiz adapt laws of personal status to the requirements of contemporary society. The progressive attitudes of some religious leaders are revealed not only in familiar law but also with respect to other matters, especially those having to do with medical developments in the field of reproduction. The literary genre in which ethics is discussed is the Fatawa (legal responses provided by religious scholars on request from lay persons or government authorities). This chapter concentrates on twentieth century Egyptian Fatawa. Egypt is by no means a country governed by Islamic Sharia principles, yet its daily newspaper, its periodicals, and other news media contain increasing numbers of Fatawa, a large portion of which deal with medical issues. Muslims do not ask their religious scholars whether one form of treatment is medically more effective than another or when to use a drug and for how long. They usually want to know the attitude of the Sharia toward the treatment and whether Islamic law permits the intake of that particular agent. They want to be assured that modern medicine as practiced is also acceptable by Sharia Islamic norms.

The following are the main characteristics of Islamic medical ethics based on Egyptian Fatawa:

1. There is a constant attempt to base modern medical treatment in the classic sources of Islamic law.
2. The problems raised are pertinent predominantly to Muslims or derive directly from the commandment and prohibitions of Islamic law.
3. When Islamic law and state law on certain medical ethics are contraindicatory, the Fatawa is issued to mediate.
4. Islamic medical ethics tend to be apologetic or show the superiority of the Islamic way of life

over that of other societies, especially those in the West.

5. Islamic medical ethics are often inseparable from social and political issues.

ISLAM AND GENDER

Most pre-Islamic urban women have lived in a male-dominated society in which their status was low and their rights negligible. They were continually under the thumb of either a male relative or a husband. Men's rights over their women were the same as their rights over any other property. Marriages were made by purchase or contract. The suitor paid a sum of money (the mohar) to the guardian of the bride-to-be (and possibly another sum, the sadaq to the woman herself), thereby purchasing her and making her his exclusive property. The marriage contract, in other words, was a contract between husband and guardian, with the bride the sales object. Furthermore, neither conventions nor laws existed to limit the number of wives that a man could have simultaneously, so the only restrictive considerations were economic ones. The marriage laws enjoin women not only to strict monogamy but also to marriage with Muslims only. Muslim men, on the other hand are free to marry Jewish, Christian, and Sabian women, although not an idolater. Both the social status and the legal rights of Muslim women were improved through Quranic legislation. Among the laws that effected such improvements were the following.

1. Laws that put an end to the pre-Islamic custom of burying baby girls alive.
2. Sanctions of marriage as a meritorious institution that invests it with importance and dignity.
3. Laws that guarantee women the right to inherit and bequeath property.
4. Laws that guarantee women the right to have full possession and control of their health, including the dower, while married and after divorce.
5. The right of the wife to be properly fed and clothed at the husband's expense.

The general attitude toward women reflected in the Hadith is positive. The Hadith elaborates on the Quran's teaching regarding the spiritual equality of women and men. The nature of women as reflected in the Hadith spans the whole spectrum from the saintly to the evil and unclean. The Hadith gives unquestionable evidence that the Hijab, which implies

not only the face veil but also the sum of practices connected with the seclusion of women, was legislatively made obligatory for the wives of the Prophet. It also contains much evidence of women's visibility as well as full participation in communal matters in the early Islamic period. Later generations of pious scholars changed these patterns considerably; rather, they sanctioned such changes as occurred within Islam under foreign influence. Through the centuries, traditionalist commentators on the Quran emphasized restrictive norms with the distinct purpose of legitimizing the newly restricted status of women in Islam. The result was that restrictions increased with the progression of time.

ISLAM AND ARTIFICIAL REPRODUCTION

Artificial reproduction was not mentioned in the primary sources of Sharia; however, these same sources affirmed the importance of marriage, family formation, and procreation. When procreation fails, Islam encourages treatment, especially because adoption is not an acceptable solution. Thus attempts to cure infertility not only are permissible but also are a duty. The duty of the physician is to help a barren couple achieve successful fertilization, conception, and delivery of a baby.

According to Islam AIH can be applied as a method of infertility treatment. Therefore the procedure of intraturine insemination of sperm separated by flow cytometry can be attempted.

The procedure of IVF-FT is acceptable, but it can be performed only if it involves only the husband and wife (21). The fusion of sperm and egg, a step beyond the sex act, should take place only within a legal marriage. Since marriage is a contract between wife and husband, during their marriage no third party can intrude into the marital functions of sex and procreation. A third party is not acceptable, whether providing egg, sperm, embryo, or uterus. If a marriage has come to an end through divorce or death of the husband, artificial reproduction cannot be performed on the woman even with sperm cells from her former husband.

Islamic law strictly condemns the practice of AID on the grounds that it is adulterous. It enhances the risk for inadvertent brother-sister marriage and violates the legal system of inheritance. The procedure also entails the lie of registering the offspring of a man who is not the real father and therefore leads to confusion of lines of genealogy, the purity of which is

of prime importance in Islam. If a man's infertility is beyond cure, it should be accepted.

ISLAM AND SEX PRESELECTION

In November 2000, a workshop organized by the International Islamic Center for Population Studies and Research at Al-Azhar University in Cairo, Egypt, supported the practice of preimplantation genetic diagnosis (PGD)(24).

Islamic view on the beginning of human life is close to Hebrew Law, that human life requiring protection commences 2-3 weeks from conception and implantation, contrary to Christianity that life begins at conception. Preimplantation of gender selection was accepted with some reservations. Family balancing was considered acceptable, for instance where a wife had borne three or four daughters and it was in her and her family's best interests that another pregnancy should be her last. Employing PGD to ensure the birth of a son might then be approved, to satisfy a sense of religious or family obligation and to save the woman from increasingly risk in future pregnancies. The workshop considered that an application for PGD for sex selection should be disfavored in principle, but resolved on its particular merits. It should be pointed that during previous seminar on Human Reproduction on Islam in 1983 they had a different statement regarding sex preselection (25).

There was an agreement on the Islamic legal viewpoint that fetal sex selection is unlawful when it is practiced at a national level, while on an individual basis, some of the scholars participating in the seminar, believe there is nothing legally wrong with the attempt to fulfill the wish of a married couple to have a boy or a girl through available medical means, while other scholars believe it is unlawful for fear that one sex might outnumber the other.

CONCLUSION

The requirement for a man to procreate by having a minimum of two children—a boy and a girl is obligatory according to Jewish law. According to both schools, Beit Shamai and Beit Hillel in order to fulfill the obligation of procreation at least one son is required. Therefore the application of sex preselection for nonmedical indications may be of practical importance using the method of sperm separation or sex selection of preembryo by PGD.

According to Christian view, especially the one of the Catholic Church, gender preselection even for medical indications is forbidden.

Islamic legal viewpoint is that fetal sex selection is lawful when it is practiced on an individual basis to fulfill the wish of a married couple to have a boy or a girl through available medical means.

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