ETHICAL ASPECTS OF ASSISTED REPRODUCTIVE TECHNIQUES

Essay
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وتشمل الرسالة على عدة جوانب مما توصل اليه العلم في تقنيات الإخصاب الصناعي والأفاق الجديدة التي طرقها وماتثيره هذه التقنيات من جوانب أخلاقية عند تطبيقها.

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ABSTRACT

Assisted reproductive technologies (ARTs) can be very helpful for certain patients, but ethical concerns have been raised about the inherent nature of specific techniques and the contexts in which many techniques are used. Physicians play important roles in supporting those who wish to become parents and in educating patients about impediments to fertilization and ways to promote conception.

We discuss various ethical issues surrounding ARTs.

The legislation and practices differ in different countries and ethical discussion and professional guidelines are still needed.

Keywords: Assisted reproductive technologies, Ethics, professional guidelines.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
ACOG	American College Of Obstetricians and Gynecologists
AD	Alzheimer's Disease
ART	Assisted Reproduction Technology
ASC	Adult Stem Cells
ASRM	American Society For Reproductive Medicine
CF	Cystic Fibrosis
CPAS	Cryoprotective Agents
EGE	The European Group On Ethics
ER	Embryo Reduction
ESC	Embryonic Stem Cell
ESET	Elective Single Embryo Transfer
ESHRE	European Society Of Human Reproduction And Embryology
ET	Embryo Transverse
FAP	Familial Adenomatous Polyposis
HCOPP Act	The Human Cloning And Other Prohibited Practices Act
HD	Huntington's Disease
HFEA	The Human Fertilization And Embryology Authority
HLA	Human Leucocytic Antigen
ICSI	Intracytoplasmic Sperm Injection Technique
ISSCR	International Society For Stem Cell Research
IVF	In Vitro Fertilization
LOS	Large Offspring Syndrome
OHSS	Ovarian Hyperstimulation Syndrome
PGD	Preimplantation Genetic Diagnosis
PGS	Preimplantation Genetic Screening
PMSR	Postmortem Sperm Retrieval
PND	Pre-Natal Diagnosis
POF	Premature Ovarian Failure
PVS	Persistent Vegetative State
SCNT	Somatic Cell Nuclear Transverse
TEM	Transmission Electron Microscopy
UFI	Uterine Factor Infertility
UNESCO	United Nations Educational, Scientific and Cultural Organization

INTRODUCTION

Medical ethics are based on the moral, religious and philosophical ideals, and principles of the society in which they are practiced. It is therefore not surprising to find that what is ethical in one society might not be ethical in another. It is mandatory for practicing physicians and critics of conduct to be aware of such backgrounds before they make their judgment on different medical practice decisions.

Responsible policy-makers in the medical profession in each country have to decide on what is ethically acceptable in their own country, guided by international guidelines which should be modified to suit their own society. Truly ethical conduct consists of personal searching for relevant values that lead to an ethically inspired decision.

As infertility and its treatment are related to procreation and the preservation of humankind, the attitudes and cultural perspectives regarding it and its alleviation are extremely sensitive issues for the Middle Eastern people.

Prevention of infertility and its relief are of particular significance in the Middle East area because a woman's social status, her dignity and self-esteem are closely related to her procreation potential in the family and in the society as a whole.

There are different modalities available for the treatment of infertility in both the female and male partners, depending upon the cause of infertility. Some of these modalities have been practiced for hundreds of years and were never of ethical concern; medical therapy, hormonal therapy, corrective and reconstructive surgery for female or male infertility are some of these modalities. The general ethical principles, which govern the medical practices in general, are also applicable to all these lines of treatment. All these modalities of treatment were not of a major ethical concern because they did not separate the bonding of the sexual act from the process of conception.

Reproduction was only possible when both partners had sexual intercourse mostly within the frame of marriage for months or years after undergoing these modalities of treatment. *(Serour GI. 1996)*

With the advent of Assisted Reproduction Technology (ART) since the birth of Louise Brown in UK on 25th July 1978, it became possible to separate the bonding of reproduction from sexual act. *(Steptoe PC and Edwards RG. 1978)*

ART, whether in vivo or in-vitro, enabled women to conceive without having sex. ART made it possible for the involvement of a third party in the process of reproduction whether by providing an egg, a sperm, an embryo or a uterus. ART opened the way for several other practices including gender selection, Preimplantation Genetic Diagnosis (PGD), genetic manipulation, cryopreservation of gametes, embryos and gonads, cloning ...etc. This challenged the age old ideas and provoked ethical debate which continued since its earliest days. *(Serour GI, Aboulghar MA and Mansour RT, 1995)*

Aim of Study

To illustrate the different views and debate in the ethical aspects of different techniques of assisted reproduction.

SPERM DONATION

Each year thousands of couples seek medical advice about their failure to conceive. One in six couples will consult a doctor over possible infertility at some stage and some will be referred to experts in the field of Reproductive Medicine.

Sperm problems are the single most common cause of subfertility and they affect about one-third of infertile couples. *(James T 2006)*

In some cases, the problems are so severe (including men who do not produce sperm) that it becomes almost impossible to conceive naturally. For some, there is the danger of passing on a genetic disease so use of donor sperm is the only alternative to achieve pregnancy. *(James T 2006)*

Indications for donor insemination:

- Azoospermia.
- Severe oligozoospermia.
- Failed intracytoplasmic sperm injection.
- Risk of transmitting genetic disorder via the man.
- Woman seeking pregnancy without male partner.
- Couples who prefer a simpler and less invasive approach to treatment than intracytoplasmic sperm injection. *(Rowell P and Braude P 2003)*

Donor Screening

Screening of gamete donors must be implemented in order to avoid the transmission of serious disease to both recipients and offspring.

Psychological evaluation of the general abilities and intellectual capacity of the donor candidates is also necessary.

Known genetic age related risks imply that sperm donors should be <50 years old. *(ESHRE 2002)*

Donors are recruited by sperm banks and are screened for a personal or family history of medical or genetic disorders and sexually transmitted infections including HIV, hepatitis B, and hepatitis C.

The donor's blood group and karyotype are tested and a serology test for previous exposure to cytomegalovirus is done.

If semen quality is normal, the potential donor should have counseling on the implications before he proceeds. If he does wish to donate, sperm samples are frozen and quarantined pending the results of two further HIV tests three and six months later. If these tests are negative, the sperm can be made available for donor insemination. *(Rowell P and Braude P 2003)*

Information registers concerning donation must be kept for 50 years in order to enable the traceability of the donors and to fulfill the possible need for information about the donor. *(ESHRE 2002)*

Particular Ethical Aspects

Anonymity

There is no single ideal solution to the problem of anonymity. Several different rights are at stake:

- The right of autonomy and privacy of the parents.
- The right of privacy of the donor.
- The right of the child to know his/her origins.

These rights cannot always be simultaneously respected.

Therefore, the double track is proposed as the solution which constitutes the best balance of all interests, taking into account the specific context of donor anonymity. In this procedure, the donor can choose to enter the programmed as an identifiable or as an anonymous donor, and the recipients can opt for an identifiable or an anonymous donor. The proposed system frame the choice about the anonymity or identifiably of the donor, like the decision as to whether or not to keep the donation secret, within the right of parental autonomy regarding the organization of their family. *(ESHRE 2002)*

Collaborative reproduction usually involves anonymous or unrelated known individuals, but some couples prefer to involve a family member in the arrangement. This may occur *intergenerational* between siblings or cousins of similar ages, such as a brother donating sperm to a brother. It may also occur *intergenerationally*, as when a father provides sperm to his infertile son.

The following table summarizes guidelines and ethics of sperm donation among first degree relatives:

Arrangement	Resulting genetic and social relationships of offspring	Comments
Brother-to-brother	Social paternal uncle is genetic father; other relationships unchanged	Most acceptable intrafamilial sperm donation
Brother-to-sister	Rearing mother is also genetic & gestational mother; social uncle is genetic father	Gives strong impression of incest, but not strictly illegal because neither sex nor marriage is involved. Should be prohibited because gametes from a consanguineous relationship are combined (sister is genetic mother and brother is genetic father)
Brother-to-sister (sister uses donated eggs)	Rearing mother is gestational mother, but has no genetic relationship to offspring; social uncle is genetic father; some cousins are half-siblings; most other relationships unchanged	Gametes are not from consanguineous relationship; not prohibited, but may create impression of incest or consanguinity
Father-to-son	Social paternal grandfather is genetic father; rearing father is genetic half-brother	Acceptability may depend upon attitude of female partner; ASRM guidelines discourage donors 40 y because of concerns for new mutations

Table (1)

Potential interfamilial collaborative Sperm donation among first degree relatives. *(ASRM 2003)*

Informing Offspring of Their Conception by Gamete Donation

An important but long unresolved question in gamete donation is whether offspring should be informed of the facts of their conception and, if so, how much information about donors should be revealed. Parents, donors, and offspring may have different interests and views on these issues. ART programs and sperm banks also vary in the information they collect from donors and the circumstances under which they release it to recipients and offspring. It is the recipient parents' choice whether to disclose the fact of donor gamete conception to their offspring. Clinicians, mental health professionals, academics, and children themselves have in recent years called for more openness in donor conception in order to protect the interests of offspring. *(Turner AJ and Coyle A. 2000)*

Because of persons' fundamental interest in knowing their genetic heritage and the importance of their ability to make informed health care decisions in the future, it is supported to disclosure about the fact of donation to children. It is also supported the gathering and storage of medical and genetic information that can be provided to offspring if they ask. It is recognized, however, that disclosure is a

personal matter to be decided by the participants, and the decisions will vary in particular situations. The ART programs and sperm banks should be encouraged to consider developing flexible policies to accommodate the varying disclosure preferences of both donors and recipients. *(ASRM 2004a)*

Payment

In principle there should be no payment for the donation of biological material. The intrinsic value of a gift, a way of showing solidarity, is higher than the positive utilitarian consequences of paying and obtaining more material. This does not exclude reasonable compensation for the effort of the donor. This compensation should not mean inordinate profit, which would deter generous unpaid donors, entice people who would not otherwise donate, or incite them to withhold information, which might be relevant for the safety of the donation. Furthermore, an excessive payment would seriously challenge the very notion of informed consent by the donor.

There are, however, many countries where this gratuity is not applied. In some countries, a pragmatic solution is proposed. An exchange of services within the context of infertility treatment seems more acceptable as compensation than direct payment for reproductive material, which we consider to be unethical. *(ESHRE 2002)*

Preconception Gender Selection for Non-Medical Reasons

The use of preconception techniques for nonmedical gender selection raises important ethical and social concerns that need thorough attention before these techniques become available for nonmedical purposes.

Attention has focused on flow cytometry separation of X and Y bearing spermatozoa as a method of enriching sperm populations for insemination. Laser beams are passed across a flowing array of specially dyed sperm in order to separate the 2.8% heavier X from Y bearing sperm to produce an X-enriched sperm sample for insemination. At present only heavier X bearing sperm can be separated effectively, making selection of females alone a likely possibility. *(Vidal F, Blanco J, Fugger EF, et al 1999)*

Until more research is done, it is not possible to say whether flow cytometry would safely permit females or females and males to be selected with such a high degree of accuracy that it would justify use for that purpose .*(ASRM 2001)*

The argument for permitting preconception gender selection is that it serves the desires of couples who have strong preferences about the gender of their offspring, some of whom might use abortion or embryo selection to realize their goal or be unhappy with children of the undesired gender. In some cases, couples with one or more children of a particular sex might strongly prefer to have a child of the opposite sex and might choose not to have another child unless they can use preconception gender selection to provide gender variety in their offspring. In other cases, they might have such strong preferences for a first-born child's gender that they might resort to postconception selection methods or not reproduce at all unless preconception methods are available. *(ASRM 2001)*

The argument against it, although preconception selection methods do not destroy embryos and fetuses or intrude on a woman's body as prenatal or preimplantation sex selection does, these procedures do raise other important issues. One concern is the potential of such techniques to increase or reinforce gender discrimination, either by allowing more males to be produced as first children or by encouraging parents to pay greater attention to gender itself.

A second concern is the welfare of children born as a result of gender selection, which may be expected to act in certain gender-specific ways when the technique succeeds and who may disappoint parents when it fails.

A third concern is societal. Widely practiced, preconception gender selection could lead to sex ratio imbalances, as have occurred in some parts of India and China because of female infanticide, gender-driven abortions, and a one-child family policy *(ASRM 2001)* Another societal concern is the emphasis that gender selection places on a child's genetic characteristics, rather than his or her inherent worth. This emphasis contributes to the commodification of offspring that many critics of assisted reproduction decry. Such practices also lead physicians to use their skills for nonmedically indicated purposes, thereby possibly diverting medical resources from more important uses. *(ASRM 2001)*

CONCLUSIONS

Infertility is a particular health problem. Sperm donation may be the only solution to remedy the lack of male gametes, enabling the accomplishment of a parental offspring without a genetic link. Sperm donation is a sensitive subject because it challenges the genetic filiations of the family, which is the central unit of most societies. Relevant specific aspects concern anonymity, compensation for donation and the consent, screening and assessment of donors and recipients should be take inconsideration. *(ESHRE 2002)*

While ultimately the choice of recipient parents, disclosure to offspring of the use of donor gametes is encouraged. *(ASRM 2004a)*

If flow cytometry or other methods of preconception gender selection are found to be safe and effective, physicians should be free to offer preconception gender selection in clinical settings to couples who are seeking gender variety in their offspring if the couples:

- Are fully informed of the risks of failure.
- Affirm that they will fully accept children of the opposite sex if the preconception gender selection fails.
- Are counseled about having unrealistic expectations about the behavior of children of the preferred gender.
- Are offered the opportunity to participate in research to track and assess the safety, efficacy, and demographics of preconception selection.

Practitioners offering assisted reproductive services are under no legal or ethical obligation to provide nonmedically indicated preconception methods of gender selection. *(ASRM 2001)*