

The Assisted Reproductive Technologies (ART): Some Clinical Aspects

Rukhsana Gazi*

Centre for Equity and Health Systems, ICDDR, Bangladesh

*Corresponding author: Rukhsana Gazi, Scientist, Centre for Equity and Health Systems, ICDDR, Bangladesh, Tel: 880-2-9882253; E-mail: rukhsana@icddr.org

Received date: Mar 23, 2015, Accepted date: Mar 24, 2015, Published date: Mar 30, 2015

Copyright: © 2015 Gazi R. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Editorial

An estimate on the prevalence of infertility from 25 population surveys sampling 172,413 women reported that the 12-month prevalence rate of infertility ranged from 3.5% to 16.7% in the developed nations and from 6.9% to 9.3% in less-developed nations, with an estimated overall median prevalence of 9% [1]. In many societies, motherhood is considered as the most valued part of womanhood, thus, infertility may place both woman and men's life at risk of social and psychological pressure and sufferings. ART is a group of procedures developed to facilitate fertilization and normal delivery for infertile couples. Some of the procedures under the ART include in-vitro fertilization (IVF), gamete intrafallopian tube transfer (GIFT), gestational carrier, egg/sperm donation program and many others [2]. Let's highlight on few of the procedures that are availed by the infertile couples. Which technique will be the best choice for a couple is largely dependent on the cause of infertility. A woman who has already had a live birth is more likely to have a successful ART procedure than a woman who hasn't given birth before. This history of "previous birth" is counted as an advantage that gradually narrows as women age advances.

However, for making choices on specific procedure, some programmatic factors like access and availability of the services in the local context, quality of services, standardization, and cost involved with specific procedure are also very important. It is crucial to ensure evidence informed choices of the couple. Before recommending a particular procedure, providers usually assess the risk and benefits, applicability and appropriateness of a procedure case by case basis; regular assessments, monitoring and counseling in the light of medical ethics to be the integral part of the procedure. Therefore, readiness and responsiveness of the health services delivery systems are required elements, particularly in the developing country context.

In vitro fertilization (IVF) is a procedure in which an egg is removed from the woman and fertilized by a sperm cell outside the human body. The fertilized egg is allowed to divide in a protected environment for about two days and then is inserted back into the uterus of the woman who produced the egg [3]. Also, named 'test tube baby' and 'test tube fertilization'. IVF has specific indications like endometriosis, low sperm counts, problems with the uterus or fallopian tubes, problems with ovulation, antibody formation that harm sperm or eggs, the inability of sperm to penetrate or survive in the cervical mucus, or an unexplained fertility problem. The key point is to know that IVF is never the first step in the treatment of infertility. Rather, it is applied when other methods such as fertility drugs, corrective surgery, and artificial insemination fails. For example, fertility drugs are tried for women who don't ovulate regularly or who have partners with very poor sperm quality. Again, there may be some risk involved using fertility drugs: risk of multiple births, premature delivery, and the risks of ovarian hyper stimulation syndrome and formation of ovarian cysts. Providers can minimize the risk of ovarian

hyper stimulation syndrome by close monitoring of the ovaries and assessing hormone levels during treatment. The risk of conceiving a multiple pregnancy is directly related to the number of embryos transferred to a woman's uterus and multiple pregnancies might be high-risk for both the mother and the fetuses. Age of the women and smoking habits of pregnant woman under treatment are found to be linked with the success of the procedure.

Gamete intrafallopian tube transfer (GIFT)

A procedure where medication is used to stimulate egg production. The egg is then removed via laparoscopic surgery and immediately mixed with washed sperm. This sperm-egg mixture is then transferred into the fallopian tubes where fertilization may then take place. Gamete refers to the male or female reproductive cells the sperm and egg.

Donor sperm program

Use of sperm collected from a man who is not the woman recipient's partner. Donor egg program: Eggs are obtained from the ovaries of another woman (usually younger) and fertilized by sperm from the recipient's partner. Resulting embryos are then transferred into the recipient's uterus. Gestational carrier: The surrogate woman carries a baby for another woman. Women whose ovaries are damaged or prematurely failing, or who have undergone chemotherapy and/or radiation; older women with poor egg quality; and women who carry genetic disorders that they don't want to pass along may require a surrogate. The surrogate becomes pregnant by artificial insemination, using the father's sperm or through IVF with the couple's embryo. Donor eggs and sperm may also be used.

Challenges for successful ART procedures

Like any other advanced medical technology, this procedure has its challenges [4], these are discussed below:

Woman's own eggs versus donor eggs

Success of ART is linked with the age of the women and whether the procedure has used a woman's own eggs or donor eggs. Many women over age 40 choose to use donor eggs, which greatly improves their chances of giving birth to healthy babies. For each cycle of in vitro fertilization. Using her own eggs, a woman's chances of having a live birth decline from over 40% in her late 20s, to 30% at about age 38, and to 10% by about age 43. Live birth rates are about the same among younger and older women using donor eggs. Women in their late 20s through mid-40s average about a 55% birth rate using fresh (not frozen) embryos.

Using frozen embryos versus fresh embryos

Donor-frozen IVF embryos from a previous IVF cycle and transferred to the uterus are less likely to result in a live birth than are donor-fresh (newly fertilized) IVF embryos. But frozen embryos are less expensive and less invasive for a woman, because stimulated ovulation and egg retrieval aren't needed.

Embryo transfer success versus the risk of multiple pregnancies

For a woman over age 35 to maximize her chances of conceiving with her own eggs and carrying a healthy pregnancy, she may choose to have more embryos transferred than a younger woman would. But this increases her risk of multiple pregnancies. Because of the risks to the babies of multiple pregnancies, experts recommend limiting the number of embryos transferred and the providers would recommend for certain number of embryos to be transferred based on age and specific situation [5].

However, there are some social and psychological aspects regarding ART procedures. A study reported that the absence of genetic and/or gestational link between parents and their child not have a negative impact on child-parent relationship or psychological well-being of mothers, fathers or children at age three [6]. Similarly, a longitudinal study found that psychological well-being of surrogate mothers did not change 10 years following the birth, with all remaining positive about the surrogacy arrangement and majority continued to report good mental health [7]. In further studies it would be interesting to look at how these children are doing in long run.

In recent years, the most advanced technologies are continuously trying to prevent or minimize the passing of donors' genetic

information to recipients' babies as it is not desirable to many couples. Now, in the context of evolving world of ART, it is expected that more vital issues/questions would come up in future in relation to legislative and ethical contexts around the prospective ground breaking advancement of ART procedures.

References

1. Boivin J, Bunting L, Collins JA, Nygren KG (2007) International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. *Hum Reprod* 22: 1506-1512.
2. <http://www.conceiveeasy.com/get-pregnant/types-of-assisted-reproductive-technologies-art/>.
3. (2010) Centers for Disease Control and Prevention, American Society for Reproductive Medicine, and Society for Assisted Reproductive Technology. Assisted Reproductive Technology National Summary Report.
4. <http://www.webmd.com/infertility-and-reproduction/in-vitro-fertilization-for-infertility>.
5. (2013) Practice Committee of the American Society for Reproductive Medicine and Practice Committee of the Society for Assisted Reproductive Technology. Criteria for number of embryos to transfer: A committee opinion. *Fertility and Sterility* 99: 44-46.
6. Golombok S, Murray C, Java V, Lycett E, MacCallum F, et al. (2006) Non-genetic and non-gestational parenthood: consequences for parent-child relationships and psychological well-being of mothers, fathers and children at age 3. *Hum Reprod* 21: 1918-1924.
7. Jadva V, Imrie S, Golombok S (2015) Surrogate mothers 10 years on: a longitudinal study of psychological well-being and relationships with the parents and child. *Hum Reprod* 30: 373-379.