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IVF: A blessing for childless

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Abstract

Infertility can lead to shame, stigma, anxiety, depression, low feelings of self-esteem and guilt. According to Times of India 27.5 million Couples in India suffering from infertility. WHO estimates the overall prevalence of primary Infertility in India to be between 3.9 and 16.8 percent ^[1]. Infertility can be due to the women (33%), the man (33%) and by both sexes or due to unknown problems (33%), approximately. Infertility can be due to varied reasons and most of the times these cause are treatable. Assisted reproductive technology (ART) is used to treat Infertility. ARTs include a wide range of treatments or procedures involving *in vitro* handling of human oocytes, sperms or embryos for establishing a pregnancy ⁵. IVF is also one of the most effective form of assisted reproductive technology. This procedure can be done by using the patient's own ovum or partner's sperm. Or it can be done by a donors egg or sperm. IVF and its extended technologies, such as Intracytoplasmic sperm injection, pre-implantation genetic diagnosis and cryotechnology, are among the most common ARTs worldwide. The total number of successful IVF and ICSI births worldwide was reported as 5 million cases in 2012 ^[6].

Keywords: Infertility, IVF, *in vitro* fertilization, HCG, assisted reproductive technology

Introduction

“Just Because Something Isn't Happening for You Right Now, Doesn't Mean It Will Never Happen”

Infertility is an important health problem, with an estimated prevalence of 60-80 million couples worldwide, probably between 15-20 million (25%) are in India alone ^[4]. is not a disease and is fairly common. It is a silent struggle. Patients who are struggling to conceive report feelings of depression, anxiety, isolation, and loss of control. Depression levels in patients with infertility have been compared with patients who have been diagnosed with cancer ^[2]. Infertility is loss of a dream, loss of an assumed future and, like every loss; it will be grieved. Pregnancy is the most beautiful phase in women life. It brings about emotional changes. Having a baby is a wonderful thing; of course it is also an occasion of changing women life. The society we are living in, fertility is highly valued. But what happen if you are trying to get pregnant and easily get discouraged when the pregnancy test comes back negative again. It can be an emotionally devastating experience.

Around 9% of couples are involuntarily childless. Atleast a quarter of couples experience unexpected delays in achieving their desired family size, although only a half seek treatment ^[3].

Definition

Infertility is defined as 12 months of appropriately timed intercourse that does not result in conception and it can affect both men and women. Infertility can be primary

means couples has never conceived or secondary means the couple has experienced a pregnancy before and failed to conceive later.

Causes of Infertility

Conception depends on the fertility potential of both the partners. The male is directly responsible in about 30-40%, the female in about 40-55% and both are responsible in about 10% cases.

Infertility Causes

Table 1: Causes of infertility in males and females

Causes of Male Infertility	Causes of Female Infertility
Undesended testis. Kartagener syndrome. Hypospadias. Thermal factor. Kallmann's syndrome. Sertoli cell only syndrome. Klinefelter's syndrome. Undesended testes. Radiation and certain drugs like antihypertensives, anticonvulsants, nitrofurantoin etc.	Anovulation or oligo-ovulation. Luteal phase defect. Hyperprolactenemia Resistant Ovarian Syndrome. Pelvic infections. Ananatomical defects of Reproductive system. Uterine fibroids. Surgery of fallopian tubes for ectopic pregnancy.

What is ART?

Assisted reproductive technologies (ART) cover a range of methods used to help couples with fertility problems

achieve pregnancy, including in-vitro fertilisation. It encompasses all the procedures that involve manipulation of gametes and embryos outside the body for the treatment of infertility.

IVF

IVF means *In Vitro* Fertilization and is a medical procedure where by an egg is fertilized by sperm in a test tube or else where outside the body.

Why IVF is done

- Fallopian tubes blocked or missed
- Severe endometriosis
- Men with Oligospermia
- Failure of Intrauterine insemination
- Having continued unexplained infertility.
- Couples wants to avoid any inherited disorders before conception
- Failed tubal ligation reversal surgery in women.

Requirements before IVF procedure

- **Ovarian reserve testing:** Testing for concentration of FSH, estradiol, Anti mullerian hormone in blood few days before the menstrual cycle. Response of ovaries to fertility medications can be tested by this.
- **Semen analysis:**
- **Infectious disease screening:** Couples can be screened for various infectious diseases like HIV/ AIDS, STDs etc.
- **Practice (mock) embryo transfer:** Mock embryo transfer can be done to determine the depth of uterine cavity in order to successfully implant embryo in womb.
- **Uterine examination:** hystero-graphy can be done to visualise the uterine cavity to find out any defect.

Steps in IVF Procedure

- **Ovulation Induction:** normally every month 1 and rarely 2 ovums are released from ovary but for IVF we need multiple eggs because some eggs won't fertilize or develop normally after fertilization. Stimulation of ovaries for producing more eggs is achieved by medications. Vaginal USG and Blood tests are oftenly done to monitor the development and maturation of follicles. When 2 or more follicles are 17-18 mm in diameter and serum E₂ level is more than 250pg/ml/Follicle, 5000-10,000 IU of HCG is given through IM route.
- **Egg retrieval:** It is done aseptically before ovulation through the vaginal route. Sedation is given to the patient and vaginal needle aspiration is done. Oocytes are kept in a culture medium for 4-6 hours.
- **Fertilization:** The sperms used for insemination *in vitro* is prepared by the wash and swim up or density gradient centrifugation technique. Healthy sperm and mature eggs are mixed and incubated. It is a conventional method of insemination. Another method named Intracytoplasmic sperm Injection is often used when semen quality or number of sperms is less. After 16-18 hours eggs are examined for signs of fertilization.
- **Embryo transfer:** Patient is given mild sedation and fertilized ovum at the stage of 6-8 blastomere is placed

into uterine cavity near fundus through a flexible soft catheter trans cervically.

Luteal phase support is maintained by using progesterone. HCG is given in supplemental doses. Micronized progesterone 200 mg is also continued for 14 days^{7,8}.

Prognostic Factors for IVF

- **Maternal age:** there is age related decline in response to ovarian stimulation, less oocytes, poor oocyte quality, less embryos and implantation rate.
- **Ovarian reserve:** Ovarian reserve means quantity and quality of follicles present in ovaries. It declines with age.
- **Smoking:** Poor outcome.
- **Fibroid uterus:** the submucous and interstitial variety of fibroid uterus have adverse outcome.

Health Hazards of ART

Though IVF is a blessing for infertile couples but sometimes it is associated with certain drawbacks. It can sometimes lead to

- Birth defects
- Miscarriages
- Perinatal mortality and morbidity
- Stress
- Multiple pregnancies
- Ectopic pregnancy
- LBW babies
- Prematurity
- Fertility drugs and cancer
- Ovarian hyperstimulation syndrome

Conclusion/Summary

Infertility is a serious health issue worldwide and it can lead to emotional, psychological as well as social problems. Despite the various social, psychological, economic and physical implications, infertility prevention often remain neglected public health issue for so long. But in recent years there is increased awareness to infertility prevention. There are wide range of treatment procedure to overcome infertility and IVF is one of them. Million of couples opts for IVF and got benefitted.

Conflict of Interest statement

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