

COMPREHENSIVE LITERATURE REVIEW ON FEMALE INFERTILITY

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Abstract

One of the physical, social, and psychological pressures on society is infertility. It is described as "the inability to establish a clinical pregnancy following a period of regular, unprotected sexual activity of at least 12 months." Ovulation induction has continued to be a significant step in the treatment of anovulatory infertility in women.

Keywords: Women infertility

Introduction

The World Health Organization (WHO) defines infertility as a reproductive system sickness when a woman is unable to conceive a child despite engaging in regular, unprotected sexual activity for 12 months or more (1). Both financial advantages and serious negative consequences result from infertility. Infertile couples are more likely than other infertile couples to have artificial worry and depression, and assisted reproductive technologies (ART) are an affordable yet effective way to alleviate sterility.

As a consequence of the disease, a woman who is unable to conceive or finds it difficult to do so may go through both physical and mental agony. Numerous medical disorders, including as fallopian tube injury, difficulty with fertilization and ovulation, and hormonal instability, may lead to infertility (3).

The Female Reproductive System: The uterus, a hollow, pear-shaped muscle organ situated between the bladder and lower intestine, is one of the most

significant reproductive organs and tissues. The cervix, which is the lowest section of the uterus, and the body make up this structure. The os opening is a vascular opening that opens into the vagina and aids in the movement of menstrual blood from the uterus to the vagina and out into the two fallopian tubes. The ovary is located next to this and seals each tube stage. 200,000–400,000 follicles make up the ovary, which is the organ responsible for generating eggs (4).

Type of Infertility: Primary or secondary infertility exists. Secondary infertility refers to couples who are unable to conceive after one year of unprotected intercourse following a previous pregnancy and not using any contraceptives and as the inability to conceive despite exposure to pregnancy for one year (2). (6). Secondary infertility is the inability to conceive a pregnancy that results in a live birth after a previous pregnancy or a previous gift to carry a pregnancy to term (7).

Diagnosis of Infertility: Since 50% of women who have infertility in the first year may also experience it in the second, it is believed that diagnosing infertility within a year of inability to conceive increases the risk of infertility (8).

Female Infertility Causes: Infertility in female may be caused due to variable factors:

Disorders of Ovulation: The (WHO) classifies ovulation disorders into three groups:

Group I: a failing hypothalamus and pituitary (hypothalamic amenorrhea or hypogonadotropic and hypogonadism). Also known as hypogonadotropic hypogonadism, it may be brought on by hypothalamic pituitary dysfunction. Amenorrhea (primary or secondary), also known as hypothalamic amenorrhea, estrogen insufficiency, and low gonadotrophin levels are usually present with these diseases. Low gonadotrophin levels are the prominent features (9).

Group II: The primary cause of polycystic ovary syndrome (PCOS), hypothalamic-pituitary-ovarian dysfunction is the major contributor to ovulation disorders.

Group III: body mass index (BMI) > 35 (Kg), with ovarian failure as a consequence of the hypothalamic cause. Increased pituitary hormones (FSH and LH) may cause inability to ovulate, and irregular menses, amenorrhea, or other reproductive issues will be caused by BMI (10).

Male Factor: When both couples have undergone testing and the man has reproductive issues, male infertility is identified (11). Semen analysis is the earliest and most popular test used to assess male infertility. A collection of descriptive measures of sperm parameters, such as concentration, motility, and morphology, as well as certain seminal plasma properties, are included in the examination of sperm (12). There are six basic reasons why men experience infertility. The first is abnormal sperm production or function. Sperm may be impacted by persistent illnesses,

undeveloped sperm or genetic flaws (13). The following values are used to evaluate male factor infertility: (13). zz Sperm supply is insufficient (less than 10 million per milliliter; volume should be 1 -5 ml. of ejaculate). Sperm motility is insufficient (over 60% should be mobile and travel forward with intention). Poor sperm morphology (greater than 50%–60% of them are shaped abnormally). Testicular abnormalities such a varicocele or the lack of the vas deferens might be found during the physical examination.

Unexplained Infertility: Unexplained infertility, which is defined as a couple's inability to conceive in which there is no identifiable explanation, affects 10–20% of all infertile couples (14). When a woman and a man's standard fertility are assessed and found to be normal, the diagnosis of unexplained infertility is established. This diagnosis is based on the kind, quantity, and caliber of tests utilized and the findings reached (15). Expectant observation combined with scheduled sexual activity and lifestyle modifications, intrauterine insemination (IUI) with clomiphene citrate, controlled ovarian hyperstimulation (COH) combined with IUI, and in vitro fertilization (IVF) are the main therapies for unexplained infertility (14).

Recurrent Miscarriage: One percent of couples attempting to become pregnant have recurrent miscarriage, which is defined as the loss of three or more successive pregnancies. According to estimates, 1-2% of second-trimester pregnancies end in miscarriage before 24 weeks (16). Less than 5% of women endure two consecutive miscarriages, while approximately 5% of women experience three or more. Recurrent

miscarriages may be divided into main and secondary recurrent miscarriages, possibly reducing the population's variability (17). A pregnancy loss happens after a positive urine test for human chorionic gonadotropin (hCG), or a "biochemical loss" is described as a rise in serum hCG levels prior to histology or ultrasound confirmation. It often happens six weeks before to conception. When histology evidence or an inspection of an ultrasound confirms the existence of an intrauterine pregnancy, the term "clinical miscarriage" is used (18).

Endometriosis: Endometriosis is a chronic inflammatory disorder reliant on estrogen that affects women throughout their reproductive years and is related with infertility and pelvic discomfort (19). Endometriosis is a chronic illness characterized by endometrial tissue development outside the uterine canal, often in the pelvic cavity, including endometrial deposits and ovaries, sometimes known as endometriomas in the ovary. Endometriosis may cause tubal damage; symptoms include painful periods, pelvic discomfort, and pain during and after sexual activity (20). Patients with endometriosis often have dysmenorrhea, dyspareunia, and pelvic discomfort. The symptoms may influence the mental, social, physical, and overall health of the patient (21).

Uterine or Cervical with the Fallopian Tubes Causes:

The fallopian tubes act as sperm-egg binding sites and are a necessary condition for natural conception. Infertility may be primarily caused by a common illness called fallopian tube blockage. Infection of the reproductive system and fallopian tube blockage are often caused by

inflammation, which typically occurs in infection sources such (22). Female infertility may result from a variety of inherited or acquired uterine conditions. These conditions include polyps, certain forms of fibromas, adenomyosis, and various endometrial illnesses such intrauterine adhesions (23).

Hormonal Causes of Female Infertility

Ovarian Insufficiency: With some women's last periods occurring in their forties and others later in their fifties, the average age of menopause is 51. Premature ovarian failure is the term used to describe ovulation that stops before the age of 40. (24). Premature ovarian failure, also known as primary amenorrhea or premature ovarian follicle depletion before the age of 40, is a primary ovarian abnormality (secondary amenorrhea). It is a wide-ranging illness that affects women between the ages of 20 and 40 in proportions of 1:10,000, 1:1,000, and 1:1,000, respectively. Primary amenorrhea and ovarian dysgenesis are the two most severe types linked with absence of pubertal development, whereas secondary amenorrhea and premature follicular depletion are the two variants that arise after pubertal commencement (25).

Luteal Phase Deficiency: By definition, a corpus luteum that produces less progesterone has a luteal phase deficiency. Histochemical data shows that the luteinized theca cells in the corpus luteum release estrogen. The corpus luteum's ability to produce estrogen seems unaffected by this disease. Infertility and recurrent first-trimester abortion are two of the defect's clinical symptoms (26). Female infertility has been linked to hormonal abnormalities. Infertility may result from abnormally high or low levels

of the hormones FSH, LH, and prolactin (27).

Polycystic Ovarian Syndrome: The most prevalent endocrine illness affecting women of reproductive age is polycystic ovarian syndrome (PCOS), which is also strongly linked to metabolic syndrome, insulin resistance, and the risk of developing diabetes and cardiovascular disease in the future (28). PCOS is the main contributor to anovulatory infertility, however ovulation failure also contributes. Other elements have a role in the impairment of reproduction. Around 50% of ovulatory women with unexplained or tubal infertility had polycystic ovaries, compared to 20% of the general, age-matched population. This phenomena takes into account Social group differences impaired maturation is linked to circulating hormone abnormalities (such as LH and serum testosterone increased levels) found in ovulatory women with polycystic ovaries.

Thyroid Disorders: Menstrual irregularities may develop from both hyper and hypothyroidism. The most typical symptom is straightforward oligomenorrhea (decreased menstrual flow). Cycles of anovulation are fairly typical. Increased bleeding may happen with hyperthyroidism, although it is uncommon (23). The thyroid is a crucial endocrine gland, and problems with it may affect many aspects of pregnancy and reproduction (29). Thyroid dysfunction in women of reproductive age may cause a wide range of gynecological problems, from irregular menstruation to infertility resulting from several pathophysiological causes (30). One of the biggest factors contributing to trouble becoming pregnant and keeping it going is hypothyroidism.

Low thyroid function affects reproductive health negatively and is more widespread than most women are aware of (27). In certain instances, it has also been connected to ovulation issues and menstrual irregularities. It may arise spontaneously, during or after pregnancy, or during hyperthyroidism therapy (30).

External Causes of Female Infertility

Contraception: Contraceptives are widely used, often by young people whose reproductive years are still ahead of them. Utilization of different forms of contraception varies by age, race, marital status, and reproductive history (45). When compared to women who stop using other forms of contraception, the recovery of fertility for those who stop using oral contraceptives takes longer (17). There is no ideal form of contraception, and each approach has a balance of benefits and drawbacks. Ideal contraceptive characteristics include being inexpensive, effective without requiring sexual activity, free of hazards or side effects, requiring no frequent user action, being acceptable to all cultures and faiths, and providing non-contraceptive advantages (19).

Sterilization: Several criteria, including the length of the surviving tube, the tubal location, the surgical procedure originally utilized, and the surgical expertise used to restore fertility, are significant in deciding whether contraceptive sterilization in women may be reversed. Some type of intermittent abstinence is used; tiny percentages of women additionally utilized suppositories, douche, withdrawal, and foam (40). Female sterilization is a method to permanently avoid becoming pregnant. By obstructing the fallopian tubes, it functions. When women decide not to have children (29).

Abortion: Abortion is the termination of pregnancy before viability of the fetus. It is often reported that a substantial percentage of women who have an induced abortion via dilatation and curettage are thereafter sterile (29). Approximately 19–20 million abortions are performed annually by untrained personnel or in substandard medical conditions, or both. In impoverished nations, virtually all abortions are dangerous (97%). (22).

Drugs and Environment: Environmental variables cannot yet be used to evaluate reproductive risks in a meaningful manner. Prior until today, drug-induced, environmental, and sub-infertility received little focus. However, because of their impact on the reproductive system, four health risks dibromochloropropane, ethylene oxide, ionizing radiation, and lead are somewhat restricted. Chemical agents, physical agents like temperature, altitude, and radiation, as well as habits like drinking alcohol, smoking like a hobbit, using medications (both recreationally and medicinally), and dietary habits are all examples of environmental dangers. Drug use impacts fertility (24).

Diagnosis of Infertility: The most typical test for identifying infertility is (26): Semen analysis, basal body temperature charts, mapping of the menstrual cycle, hormone assays, cervical mucus evaluation, post-immunologic evaluation, endometrial biopsy, coital test hysterosalpingogram, laparoscopy, hysteroscopy, and Hamster-egg penetration assay are some of the other procedures that are done on a couple.

Treatment of Female Infertility: Surgery, medication, assisted reproductive technology, and artificial insemination are all options for treating infertility.

These therapies are often combined. Infertility is often treated with surgery or medication. Doctors may suggest certain infertility treatments depending on test findings, the length of time a couple has been trying to conceive, the age of both spouses, their general health, and their preferences (30).

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