

Male and Female Infertility: Causes, And Management

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Abstract: Infertility is a common problem worldwide. Childlessness could be male infertility, female infertility or combined infertility. Infertility has psychological and social impact. Female infertility is due to ovulatory problem, in male semen quality, and idiopathic cause. Sexually transmitted disease (STD), genetic, diabetes, pituitary factors, and toxins also play an important role. Diagnosis include, semen analysis, for male, female partner tested for hormonal parameters, e.g., FSH, TSH, abnormal levels indication of infertility. If the conservative medical treatment fail, physician may advise the patient to undergo in-vitro fertilization (IVF), and assisted reproductive technology (ART). IVF has promising results.

Keywords: Infertility, Causes, Psychological and social impact, Treatment.

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I. Introduction

In humans, infertility is the inability to become pregnant or carry a pregnancy to full term, There are many causes of infertility, including some that medical intervention can treat [1]. Estimates from 1997 suggest that worldwide “between three to seven per cent of all (heterosexual) couples have an unresolved problem of Infertility. Many more couples, however experience involuntary childlessness for at least one year; estimates range from 12% to 28% [2.], 20-30 % of infertility cases are due to male infertility, 20-35% are due to female infertility, and 25-40% are due to combined problems in both parts [3]. In 10 – 20 % cases no cause is found [3]. The most common cause of female infertility is ovulatory problems which generally manifest themselves by sparse or absent menstrual periods [4]. Male infertility due to deficiencies in the semen, and semen quality is used as surrogate measure of male fecundity [5]. Young and healthy couples with infertility problem should seek prompt help from the healthcare providers [6]. Treatment depends on the cause of infertility, but may include counselling, fertility treatments, which include in vitro fertilization [7].

II. Interpretation of infertility

“Demographers tend to interpret (define) infertility as childlessness in a population of women of reproductive age”, whereas “the epidemiological definition refers to “trying for” or “time to” a pregnancy in a population of women exposed to a probability of conception [8]. A female is most fertile within age 24 and diminishes after 30, with pregnancy occurring rarely after age 50 [9]. The time needed to pass (during which the couple tries to conceive) for that couple to be diagnosed with Infertility differs between different jurisdictions. Existing definitions of infertility lack uniformity, rendering comparisons in prevalence between countries or over time problematic. Therefore, data estimating the prevalence of infertility cited by various sources differs significantly [8]. A couple that tries unsuccessfully to have a child after a certain period of time (often short period, by definition vary) is sometimes said to be **subfertile**, meaning less fertile than a typical couple. Both infertility and subfertility are defined as the inability to conceive after a certain period of time (the length of which vary), so often two terms overlap [8].

World Health Organization (WHO), defines infertility as: Infertility is “a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular sexual intercourse (as there is no other reason, such as breastfeeding or postpartum amenorrhea). Primary infertility is infertility in a couple who have never had a child. Secondary infertility is failure to conceive following a previous pregnancy. Infertility may be caused by infection in the man or woman, but often there is no obvious underlying cause.” [10].

One definition of infertility that is frequently used in the United States by reproductive endocrinologist, doctors who specialize in infertility, to consider a couple eligible for treatment is: (a). a woman under 35 has not conceived after 12 months of contraceptive intercourse. Twelve months is the lower reference limit for *Time to*

Pregnancy (TTP) by the WHO [5].(b).a woman over 35 has not conceived after 6 months of contraceptive-free sexual intercourse.

In the UK, previous NICE guidelines defined infertility as failure to conceive after regular unprotected sexual intercourse for 2 years in the absence of known reproductive pathology [11]. Updated NICE guidelines do not include a specific definition, but recommend that “A woman of reproductive age who has not conceived after one year of unprotected vaginal intercourse ,in the absence of any know cause of infertility, should be offered further clinical assessment and investigation along with her partner, with earlier referral to a specialist if the woman is over 36 years of age [12]. Researchers commonly base demographic studies on infertility prevalence on a five year period. Practical measurement problems, however, exist for much definition, because it is difficult to measure continuous exposure to risk of pregnancy over period of years [13].

Primary infertility is defined as the absence of a live birth for woman who desire a child and have been in a union for at least 12 months, during which they have not used any contraceptives [14]. WHO also adds that ‘ woman whose pregnancy spontaneously miscarries, or whose pregnancy results in a still born child, without ever having had a live birth would present with primarily infertility [15]. Secondary infertility is defined as the absence of a live birth for woman who desire a child and have been in a union for at least 12 months since their last live birth, during which they did not use any contraceptives [15].

III. Psychological and social impact

Mental stress or Psychological effect: The consequences of infertility are manifold and can include social repercussions and personal suffering. Advances in assisted reproductive technologies, such as IVF, can offer hope to many couples where treatment is available, although barriers existed in terms of medical coverage and affordability. The medicalization of infertility has unwittingly led to a disregard for the emotional responses that couples experience, which include distress, loss of control, stigmatization, and a disruption in the development of trajectory of adulthood [16]. Infertility may have profound-psychological effects. Partners may become more anxious to conceive, increasing sexual dysfunction [17]. Marital discord often develop in infertile couples, especially when they are under pressure to make medical decisions. Woman trying to conceive often have clinical depression rates similar to women who have heart disease or cancer [18]. Even couples undertaking IVF face considerable stress [19]. The emotional losses created by infertility include the denial of motherhood as a rite of passage; the loss of one’s anticipated and imagined life; feeling of loss control over one’s life; doubting one’s womanhood; changed and sometimes loss of friendship; for many, the loss of one’s religious environment as a support system [20]. *Emotional stress and marital difficulties are greater in couples where the infertility lies with the man* [21].

Society and social effect: In many cultures, inability to conceive bears a stigma. In closed social groups, a degree of rejection (or a sense of being rejected by the couple) many cause considerable anxiety and disappointment. Some respond by actively avoiding the issue altogether; middle-class men are the most likely to respond this way [22]. In an effort to end the shame and secrecy of infertility. Redbook in October 2011, launched a video campaign. The Truth about Trying, to start an open conversation about infertility, which strikes one in eight women in the United States.

In a survey of couples having difficulty conceiving, conducted by the Pharmaceutical company Merk, 61 percent of respondents hid their infertility from family and friends [23]. Nearly half didn’t even tell their mothers. The message of those speaking out: it’s not always easy to get pregnant, and there is no shame in that. There are legal ramifications as well. Infertility has begun to more exposure in legal domain. An estimated 4 million workers in the U.S. used the Family and Medical Leave Act (FMLA) in 2004 to care for a child, parent or spouse, or because of their own personal illness. Many treatments for infertility, including diagnostic tests, surgery and therapy for depression, can qualify one for FMLA leave. It has been suggested that infertility be classified as a form of disability [24].

IV. Contributory factor

There are several contributory factors or causes of infertility that includes:

Sexually transmitted disease (STD): Infections with the following sexually transmitted pathogens have a negative effect on fertility: *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. There is consistent association of *Mycoplasma genitalium* infection and female reproductive tract syndromes. *M .genitalium* infection is associated with increased risk of infertility [25].

Role of genetic: A Robertsonian translocation in either partner may cause recurrent spontaneous abortions or complete infertility. Mutations to NR5RA1 gene encoding Steroidogenic Factor-1 (SF-1) have been found small subject of men with no-obstructive male factor infertility where the cause unknown. Results of one study investigating a cohort of 315 men revealed changes within the hinge region of SF-1 and no rare allelic variants in fertile control men. Affected individuals displayed more severe forms of infertility such as

azoospermia(absence of sperm in the semen) and severe oligozoospermia(below normal spermatozoa in the semen).[26].

Miscellaneous infertility factor in male and in female:

- DNA damage reduces fertility in female ovocytes,as causes by smoking [27].DNA damage reduces fertility in male sperm, as caused by oxidative DNA damage [28].
- Diabetes mellitus, thyroiddisorders, undiagnosed and untreated coeliac disease, and adrenal disease [29-32].
- Hypothalamic pituitary factors,hyperprolactinemia,hypopituitarism,and presence of anti-thyroid antibodies[33].
- Toxins such as glues, volatile organic solvent or silicones, chemicaldust, and pesticides [34].
- Immune infertility due to the anti-sperm antibodies [35].
- German scientists have reported that a virus called Adeno-associated virus might have a role in male infertility [36].

Female infertility:

For a woman to conceive, certain things to happen:vaginal intercourse must take place around the time when egg is released from her ovary; the system that produce eggs has to be working at optimum levels and her hormones must be balanced [37].For women, problems with fertilization arise mainly from either structural problems in the Fallopian tube or uterus or problem releasing eggs. Infertility may be caused by blockage of the Fallopian tube due to malformation, infections such as Chlamydia and or scar tissue. Forexample, endometriosis can cause infertility with the growth of endometrial tissue in the Fallopian tubes and or around the ovaries, Endometriosis is more common in women in their mid- twenties and older, especially when postponed childbirth has taken place [38].`

Another major cause of infertility in women may be inability to ovulate. Malformations of the eggs themselves may complicate conception. For example, polycystic ovarian syndrome in which eggs only partially developed within ovary and there is excess of male hormones. Some women are infertile because their ovaries do not mature and release eggs. In this case synthetic FSH injection or Clomid(Clomiphene citrate) via pill can be given to stimulate follicles to mature in the ovaries. Other factors that can affect a woman's chances of conceiving include being overweight or underweight or her age as female fertility declines after the age of 30 [39,40].

Common contributory factors-causes of infertility of females include:

- (a).Ovarian problems(e.g.polycystic ovarian syndrome-PCOS),the leading reason why women present to fertility clinic due to anovulatory infertility [41].
- (b).tubal blockage
- (c).pelvic inflammatory disease (PID) caused by infections like tuberculosis
- (d).age related factors
- (e)..uterine problems
- (f).previous tubal ligation
- (g). endometriosis
- (h).advance maternal age

Male infertility

The main cause of male infertility is low semen quality. In men who have the necessary reproductive organs to procreate, infertility can be caused by low sperm count due to endocrine problems, drugs, radiation, or infection. There may be testicular malformation, hormone imbalance, or blockage of man's duct system. Although many these can be treated through surgery or hormonal substitutions, some may be indefinite [42].Infertility associated with immotile sperm may be caused by primary ciliary dyskinesia. The sperm must provide the zygote with DNA centrioles, and activation factor for the embryo to develop. A defect in these sperm structures may result in infertility that will not be detected by semen analysis [43].

Environmental factors like exposure to chemical dust and pesticides have adverse effect of male fertility [34].Widely used pesticides DDT(1,1,1-trichloro-2,2,2-bis(p-chlorophenyl)ethane) and industrial chemical e.g. PCBs(Polychlorinated biphenyls),and environmental pollutants such as dioxin and human therapeutics such as anti-cancer drugs [44,45].Perry and associates also showed the effects of environmental and occupational pesticide on human sperm[46].Hossain, and colleagues in a series of 160 subjects, with 52 (32.5%) exposed, advocate that overall the decline in semen quality may adversely affect the fertility index of exposed subjects [47].

Male and female infertility: In some cases, both the man and woman may be infertile or sub-fertile, and couple's infertility arises from the combination of these conditions. In other cases, the cause is suspected to be

immunological or genetics; it may be that each partner is independently fertile but the couple cannot conceive together without assistance [43].

Infertility due to unknown cause (idiopathic):In the U.S, up to 20% of infertile couples have unknown (unexplained) infertility [48].In these cases abnormalities are likely to be present but not detected by current methods. Possible problems could be that the egg is not released at optimum time for fertilization that it may not enter the fallopian tube, sperm may not be able to reach the egg, fertilization may fail to occur, transport of zygote may be disturbed, or implantation fails. It increasingly recognized that egg equality is of critical importance and woman of advanced maternal age have eggs of reduced capacity for normal and successful fertilization. Also, polymorphisms in foliate pathway genes could be one reason for fertility complications in some women with unexplained infertility [49,].However, a growing body of evidence suggests that epigenetic modifications in sperm may partly responsible [50].

V. Diagnosis

If both partners are young and healthy and have been trying to conceive for one year without success, a visit to a physician or woman health nurse practitioner (WHNP) could help to highlight potential medical problems earlier than later. The doctor of WHNP may also be able to suggest lifestyle changes to increase the chances of conceiving [6].Woman over the age of 35 should see their physician or WHNP after six months as fertility tests can take some time to complete, and age may affect the treatment options that are open in that case. A doctor or WHNP takes a medical history and gives a physical examination. They can also carry out some basic tests on both partners to see if there is an identifiable reason for not having achieved a pregnancy. If necessary, they refer patients to a fertility clinic or local hospital for more specialized tests. The results of these tests help determine the best fertility treatment [6].

Frequently used diagnostic tests include semen analysis for male partner (volume 2.5 to 10ml,sperm count over 20 million, motility over 70 % morphology over 60%,low volume, count, and motility-infertility).For female partner is tested for Follicle stimulating hormone-serum (FSH), and Thyroid stimulating hormone (TSH),.Any abnormal levels of FSH and TSH – infertility.[5

VI. Treatment

Treatment depends on the cause of infertility, but may include counselling, fertility treatments, which include in vitro fertilization. According to ESHRE recommendations, couples with an estimated live birth rate of 40% or higher per year are encouraged to continue aiming for a spontaneous pregnancy [7].Treatment methods for infertility may be grouped as medical or complementary and alternative treatments. Some methods may be used in concert with other methods. Drugs used for both women and men [52], include clomiphene citrate, human menopausal gonadotropin(hMG),follicle stimulating hormone (FSH),human chorionic gonadotropin(hCG),gonadotropin releasing hormone(GnRH) analogues, aromataseinhibitors, and metformin.

Medical treatment of infertility generally involves the use of fertility medication, medical device, surgery, or a combination. If the sperm are of good quality and the mechanics of the woman's reproductive structures are good (patent fallopian tubes, no adhesion or scarring), a course of stimulating medication may be used. The physician or WHNP may also suggest using a conception cap-cervical cap, which patient uses at home by placing the sperm inside the cap and putting the conception device on the cervix, or intrauterine insemination(IUI),in which the doctor or WHNP introduces sperm into uterus during ovulation, via catheter .In these methods fertilization occurs inside the body[52].If conservative medical treatments fail to achieve full time pregnancy, the physician or WHNP may suggest the patient undergo in vitro fertilization(IVF).IVF and related (ICSI,ZIFT,GIFT) are called assisted reproductive technology (ART) techniques. ART techniques generally start with stimulating ovaries to increase eg.production. After stimulation, the physician surgically extracts one or more eggs from the ovary, and unites them with sperm in a laboratory setting, with the intent of producing one or more embryos. Fertilization takes place outside the body, and the fertilized egg is reinserted into the woman's reproductive tract, in a procedure called embryo transfer. Other medical techniques are e.g. turboplasty,assistedhatching, and Preimplantation genetic diagnosis. [52].

IVF is the most commonly used ART. It has been proven useful in overcoming infertility conditions, such as blocked or damaged tubes, endometriosis, repeated IUI failure, unexplained infertility, poor ovarian reserve, poor or even nil sperm count. ICSI(Intracytoplasmic sperm injection) technique is used in case of poor semen quality, low sperm count or failed fertilization attempts during prior IVF cycles. This technique involves an injection of a single healthy sperm directly injected into mature egg. The fertilized embryo is then transferred to womb [52].Medical or Fertility tourism is the practice of traveling to another country for fertility treatments. The main reason for fertility tourism is legal regulation of the sought procedure in the home country or lower price.In-vitro fertilization and donor insemination are major procedures involved [53].

VII. Conclusion

World health Organization (WHO) defines infertility is a “disease” of the reproductive system. It may be primary or secondary. Ovarian problems (polycystic ovary),tubal blockage, PID,age related factors, and endometriosis are frequent contributory factors. In-vitrofertilization (IVF) and ART techniques have promising results.

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