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REVIEW ARTICLE

In Vitro Fertilization: Trends, Criticism and Challenges

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Abstract

Assisted Reproductive Technology (ART) frequently uses *in vitro* fertilization (IVF), a sophisticated method of treating infertility in which a donor or non-donor ovum is fertilized in a laboratory using either donor sperm or spouse's semen. IVF can employ donor sperm and owner partner sperm, donor sperm and donor ovum, donated embryos, and patient ovum and partner sperm, depending on the kind of infertility. An increasing number of people are now having IVF procedures because of the convergence of supply driven by new technology and increased demand brought about by sociodemographic changes. An increase in the use of IVF is being driven by shifting societal standards and demographics. Because of its higher success rate, *in vitro* fertilization has emerged as the gold standard for treating infertility. However, there are a number of challenges and criticisms surrounding this procedure, which deters some people from using it as a cure for infertility.

Keywords: Assisted reproductive technology, Criticism, Infertility, *In vitro* fertilization

Introduction

Ten to fifteen percent of couples experience difficulty conceiving.[1] According to Jacqueline H infertility can be described as 'the inability to conceive after six months for women over 35 as well as not being able to conceive after 12 months for women whose age falls under 35, who have not engaged in protected sexual activity'.[2] The technique of fertilizing an ovum with sperm outside the body of a human being is called '*in vitro* fertilization' (IVF). It starts with the extraction of oocytes from within the ovary, continues with *in vitro* fertilization, and is completed with the transfer of the resultant embryo into the uterus of the intended mother or a surrogate.[3] *In vitro* fertilization or IVF, was a fertilization method that resulted in "test-tube babies." The world's first artificially conceived child, Louise Joy Brown, was born in England on July 25, 1978. In Nigeria, the first artificially conceived child was born in 1986.[4] *In vitro* fertilization (IVF) and other assisted reproductive technologies (ART) have been used to birth 1.9% of all newborns in the United States since its inception in 1981, although only around 5% of infertile couples seek out this treatment.[5] Man's ability to procreate has been reinterpreted with the introduction of IVF into clinical practice in 1978. IVF was first created to help infertile couples, but its clinical indications have since quickly grown to include a variety of illnesses, genetic disorders, and fertility preservation. Although access to and use of IVF varies greatly throughout the world, in many European nations where

the procedure is relatively inexpensive and/or supported by insurance, it currently accounts for the conception of over 5% of all newborns.[6] The equivalent figure is currently rising quickly worldwide, with Australia and New Zealand having about 4.1 percent, the USA with 1.9 percent, and 1.7 percent in China.[6] These days, infertility brought on by a number of factors such as endometriosis, male factor, and unexplained infertility is commonly treated using IVF. IVF with donor oocytes has made it possible for women who are unable to conceive naturally because of primary ovarian insufficiency (POI) or age-related decrease in oocyte quantity to become pregnant.[7]

Causes of Infertility

The factors that affected women included, pelvic inflammatory disease (PID), endometriosis, tuboperitoneal disease, and oligomenorrhea or amenorrhoea. Male-related causes include, poor quality semen, which might include reduced sperm count, motility, or morphology (sperm shape).[7] In the US, about 1 in 8 couples struggle with infertility. Infertility is a reproductive health issue that accounts for 30% of cases in Nigeria and is the primary cause of gynaecological consultations.[8] Due to the way society values children, most low-income countries view parenthood as a societal duty to procreate, and infertility is unwanted and stigmatized. Although infertility among couples generally presents considerable issues in Africa, infertile women experience more societal implications than infertile men.[9] Worldwide, IVF technology has been used to conceive almost five million infants in the previous three decades.[7,10] As a result, issues with infertility among couples have increased demand for *in vitro* fertilization methods globally. The factors that propelled the IVF market were the increased number of delayed pregnancies, greater awareness of and improvements in IVF technology, and rising rates of infertility among couples.[11] IVF can use donated embryos, donor ovum and donor sperm, patient ovum and partner sperm, donor ovum and owner partner sperm, and patient ovum and donor sperm.

Criticism

The term "*in vitro* fertilization (INT) is associated with public funding, surrogacy, commercialization, ethical considerations surrounding the issues regarding age limits, ownership of stored gametes and embryos, INT for both for women who are single and people who are in same sex relationships, preimplantory genetic diagnosis, social ovum freezing, ovum sharing, surrogacy, and IVF prioritization.[12]

Cultural criticism contributes to gender inequality in infertility in many nations. Even though they are not the cause of infertility, women are frequently held responsible for it. Infertility results in anxiety, frustration, grief, fear, marital distress, domestic violence, economic suffering, social stigma, community rejection, divorce, polygamy, and possibly even life-threatening medical intervention on the part of the female partner. Previously there was hesitancy on the part of spouses to seek medical guidance when infertility was caused by a female factor, more so if the treatment that was recommended was unconventional. For female factors, husbands typically oppose taking part in or allowing their wives to undergo ART. In addition, many men were reluctant to consent to ART, since in certain cultures, polygamy is a way for husbands to father children born of infertility if the wife was the cause of the infertility. This was particularly true in rural areas. Some cultures consider children born through IVF to be illegitimates, which puts further pressure on the mother or encourages the husband to choose another wife rather than use IVF.[13]

Religion Criticism: While Jews are advised to procreate (Genesis 1:28, "Be fruitful and multiply, fill the earth and subdue it"), infertility is acceptable and even encouraged in Israel. For instance, there is constant discussion among Orthodox Jews on the collection of sperm and the donation of gametes and embryos (the "spilling of seed" is prohibited). Hinduism accepts most forms of assisted reproduction, but requires that the sperm and egg come from a married couple. There are, however, certain exceptions: sperm may also be provided by a close relative of an infertile male.[14] Buddhism is quite accepting of IVF. It is legal to donate sperm, and IVF is not just for married couples to use. According to Sunni Islamic fatwas (religious beliefs:rulings), all forms of assisted reproduction are permissible as long as the sperm and oocyte are those of the husband and his wife. Because it includes a third party in the process of conception, it is illegal to donate gametes or embryos to another individual. Most Sunni Muslims are in favour of surrogacy as long as the intended parents' gametes are used.[15] The Roman Catholic Church, which issued

a doctrinal statement against the treatment in 1987, has been the primary opponent of *in vitro* fertilization. The church opposes *in vitro* fertilization for two reasons, according to the statement: first, it would remove reproduction from the context of marriage by destroying human embryos that are not used for implantation; second, it would cut off an important link between procreation and the conjugal act. The primary sources of opposition to IVF in general these days are the Catholic and Orthodox Christian contexts. The IVF debate has also cited the philosophical claim that birth is preferable to non-birth; the opposite position is widely held in both philosophy and religion, as demonstrated by the views presented in a book titled 'Better Never to Have Been: the Harm of Coming to Existence', written by David Benatar a great philosopher.[16] As a result, it is difficult to determine how much religious beliefs have influenced the regulations in various countries pertaining to IVF and other assisted reproductive technologies.

Public Debate

Age limit

After undergoing IVF, mothers in their upper middle years may face criticism from the public on how "unfitting," "unnatural," or even "repulsive" their child's birth is. The age restriction that applies to people between the ages of 40 and 50 appears to be accepted by popular discourse. The possibility of specific events, such as a successful pregnancy or the mother passing away before the kid is able to support itself, as well as the implications of those occurrences, are examples of arguments that are founded on facts. The rights of women to make reproductive decisions for themselves and children to be raised in safe environments are the most evident value-based arguments. The father's age limitations have not received much attention. When it comes to having children, men are typically older than women and have a little lower life expectancy. Consequently, the justification for a man's ability to raise a child until adulthood would apply just as much, if not more, to males than to women. Individual evaluations should be conducted, considering biological age rather than chronological age, in place of an upper age restriction. The child's needs are highlighted: at least one parent should be young enough to raise the child till they are an adult.

Single Women and Same-Sex Couple

In most cases, same-sex couples that contain women are not specifically protected by law. However, in cases where *in vitro* fertilization is legal for single women, the same rules would presumably apply to same-sex couples that contain women. Programs providing *in vitro* fertilization and other reproductive treatments were urged by the American Society for Reproductive Medicine's ethics committee to "treat all requests for assisted reproduction equally without regard to marital/partner status or sexual orientation" in a 2013 statement.[17] Most countries that allow surrogacy also allow *in vitro* fertilization, which means that a surrogate mother can be conceived with the help of sperm donated by a potential homosexual father. A child's right to know its biological parents and the circumstances surrounding its conception is rooted in the principle of autonomy. This includes the right to know who donated their gametes.

Ownership of Stored Gametes and Embryos

The goal of humankind has always been to achieve some sort of genetic immortality through progeny. People may now plan ahead thanks to gamete storage, which makes it possible to arrange for an early death or communal reproduction. The intention is for one genetic "identity" to survive our passing. In addition to the wishes of the departed, the family frequently wishes for their loved one to live on indefinitely. According to, Ahmad A, the family may get some solace from their grief if preserved gametes or embryos are used. In the event that a patient passes away, the surviving female partner is entitled to utilize the stored gametes; but in theory, the surviving male partner may choose to use the deceased female partner's ovum in order to have a child through surrogacy. While some nations, like the UK and the USA, approved of it, others, including France, Germany, and Sweden, did not. It would be more acceptable to discuss disposal rather than tight ownership in the event of a divorce between a couple who has agreed to store embryos for future usage.[18]

IVF and Preimplantatory Genetic Testing (PGT) provides a means for avoiding pregnancy with a child with severe monogenetic disease, in families where a child with the condition has already been born.[1] In order to achieve "family balancing," PGT can also be used to choose embryos based on sex.

The Storage of Oocytes for Social Reasons

Oocyte cryopreservation, which is also referred to as social ovum freezing, is a method that has been created as a means of retaining and preserving oocytes that have been retrieved at an earlier age. This is due to the fact that the success rate of *in vitro* fertilization (IVF) rapidly drops beginning at the age of 35 when the woman uses her own ovum. According to, Borovecki A, saved oocytes are utilized in the process of *in vitro* fertilization (IVF), when it is more socially acceptable to have a child that is conceived.[19]

Ovum Sharing

When a lady who is currently undergoing IVF gives some of her ovum to other women, this practice is known as 'ovum sharing'. The eggs may be donated to the clinic where she is receiving treatment in exchange for free or significantly reduced care, or it may be done purely out of altruism. In that case, an indirect financial incentive is presented. Never should the woman feel pressured to disclose her ova; instead, she should undergo expert counselling before taking any further action.

Surrogacy

Partial surrogacy involves using insemination to start the pregnancy; full surrogacy uses eggs from a different woman than the surrogate mother.[12] In case of a full surrogacy, the eggs and sperm that are used can come from either the intended parents or from outside donors. Because of this, *in vitro* fertilization (IVF) methods that are utilized in full surrogacy contain genetic connections to one, two, or none of the intended parents, but not to the surrogate mother.

To the extent that it is feasible from a medical stand point, it seems that the majority of people who are planning to become parents want to optimize their genetic connection. The fact that the surrogate mother will be leaving her genetic link to the child she is carrying with the surrogate father may help mitigate any psychological effects, which is another reason in support of full surrogacy. This is an argument that provides support for full surrogacy. It is possible that the intended parent will be subjected to stigma if the general public finds out that they are employing a surrogate mother.

The Business of *in vitro* Fertilization

The "IVF industry" is one manifestation of what social scientists call a growing trend towards a market-driven understanding of health, medicine, and the human body".[20] This describes a pattern that is becoming increasingly prevalent. On the other hand, the majority of the public discourse concerning the commercialization of *in vitro* fertilization has not been centred on IVF in and of itself; rather, it has been centred on the payment of gamete donors, notably ovum donors, the sale of embryos, and the utilization of IVF for commercial surrogacy. The public funding of *in vitro* fertilization (IVF) and the prioritizing of these procedures are based on three ethical precepts.

Respect for human dignity as a principle: In its most basic form, this principle is one of non-discrimination, equal value, and respect for human rights.[21,22] Access to healthcare services should not be restricted on the basis of a variety of factors, including but not limited to gender, socioeconomic standing, sexual orientation, sexual religion, age, or cognitive capacity. The differences in access to public funding for *in vitro* fertilization that exist between different regions and socioeconomic backgrounds constitute a violation of the idea of human dignity.

The notion of solidarity and the necessity for support: Patients with the greatest need ought to be provided with the resources that are at their disposal. When determining whether or not a healthcare intervention is necessary, three elements are taken into consideration: (a) the severity of the health problem; (b) the likelihood of a favourable health outcome as a result of the intervention; and (c) the scientific basis for a favourable benefit-risk ratio. In addition to other things, the manner in which the media portrays the absence of children. However, decisions on public funding for *in vitro* fertilization (IVF) are made at the group level rather than at the individual level within the group.

The principle of cost effectiveness: This principle states that there should be a fair balance between the costs and benefits of interventions, and that the healthcare system has an obligation to use its resources as efficiently as possible. Three main elements determine whether IVF is cost-effective: (a) treatment success rates; (b) multiple pregnancies; and (c) treatment costs.[23]

Risk of injectable Fertility Medicine

- Injection sites may experience mild bruising and pain. Changing injection sites might alleviate these symptoms.

- Common side effects include nausea and vomiting, as well as temporary allergic responses such as skin reddening and itching at the injection site.
- Breast pain and increased vaginal discharge.
- Mood swings and weariness.
- Ovarian hyperstimulation syndrome (OHSS) often causes moderate symptoms such as nausea, bloating, and ovarian pain. They often go away without therapy after a few days of ovum harvest. In extreme circumstances, OHSS can cause significant fluid buildup in the abdomen (belly) and lungs. This can lead to enlarged ovaries, dehydration, difficulty in breathing, and severe stomach discomfort.[24]

Ovum Retrieval

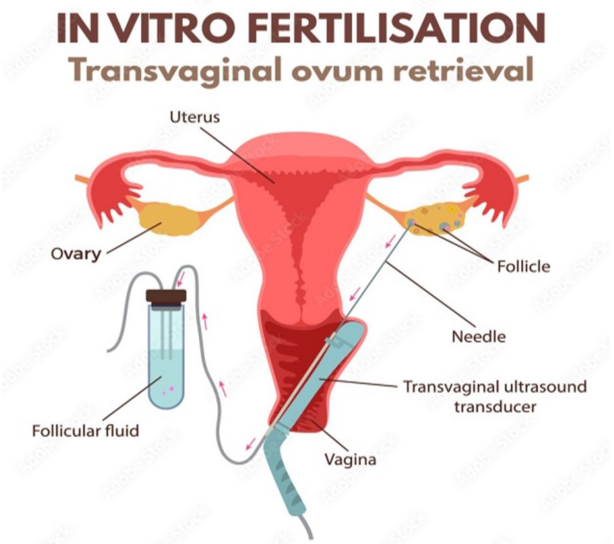

Figure 1: *In vitro* fertilization

A sedative or painkiller may be administered during ovum retrieval, which can be performed in the clinic 34 to 36 hours following the last injection and prior to ovulation. In most cases, transvaginal ultrasound aspiration is used for retrieval. Follicle detection involves inserting an ultrasonic probe into the vagina. The next step, guided by ultrasonography, is to remove the eggs by putting a small needle into the follicles and vagina. If the ovaries cannot be reached by transvaginal ultrasonography, an abdominal ultrasound can be used to guide the needle.

Using a needle attached to a suction apparatus, the ova are extracted from the follicle. One can extract many ova in roughly twenty minutes.

- The client may have cramps and a pressured, full feeling after the ovum is removed.
- The mature eggs are incubated in a nutrient-rich liquid called 'culture medium'. In an effort to generate embryos, mature, healthy ova will be combined with sperm. Not every egg will, however, fertilize successfully.

Risk

- Moderate to mild pain in the abdomen and pelvis (during or after). Over-the-counter painkillers can be used to treat the pain, which often goes away in a day or two.
- Damage to the blood arteries, colon, or bladder, which are organs close to the ovaries. Bowel or blood vascular injuries can very infrequently necessitate emergency surgery or blood transfusions.
- Mild to severe pelvic infections. Nowadays, pelvic infections during ova retrieval or embryo transfer are rare since antibiotics are typically administered at the time of ova collection.
- To handle a serious infection (albeit unusual), surgery to remove one or both of the ovaries and tubes and/or the uterus may be necessary. Serious infection may necessitate hospitalization and/or treatment with intravenous antibiotics. IVF-related infections are more common in women who have experienced pelvic infections or ovarian endometriosis.

Sperm retrieval procedure

On the morning of ova retrieval, a semen sample must be brought to the doctor's office or clinic, if the client is utilizing their partner's sperm. Usually, masturbation is used to obtain a semen sample. Sometimes additional techniques are needed, like testicular aspiration, which involves taking sperm directly out of the testicle via a needle or surgical operation. Sperm from donors may also be used. In the laboratory, sperms are isolated from the semen fluid.

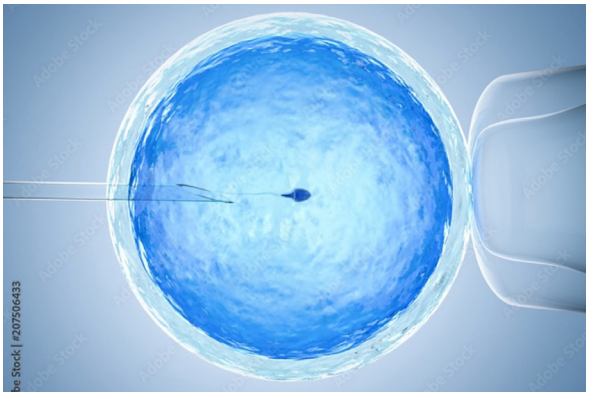

Figure 2: Sperm retrieval

Fertilization

There are two popular techniques for fertilizing an egg.

Conventional insemination

Mature ova and healthy sperm are combined during traditional insemination, and the mixture is then incubated overnight.

Intracytoplasmic sperm injection (ICSI)

A single healthy sperm is immediately inserted into each mature ovum during ICSI. When there is an issue with the quantity or quality of semen, or if previous IVF cycles failed to result in fertilization, ICSI is frequently performed.

The doctor can suggest additional treatments prior to embryo transfer in specific circumstances.

Facilitated Egg-Laying

Some five or six days following fertilization, the embryo "hatches" from its enclosing membrane, allowing it to implant into the uterine lining. If the woman is old or has tried and failed at IVF several times, her doctor may recommend aided hatching, a technique that involves cutting a hole in the zona pellucida just before transfer to aid embryo hatching and implanting. Because assisted hatching hardens the zona pellucida, it is also beneficial for eggs or embryos that have been frozen in the past.

Genetic testing prior to implantation

Embryos are kept in the incubator until they are developed enough, usually five to six days, to allow for the removal of a small sample for testing for certain genetic illnesses or the correct number of chromosomes. Transferring embryos to the owner's uterus is possible if they don't have any chromosomes or genes that are impacted. Preimplantation genetic testing can lessen, but not completely eliminate the probability that a parent will pass on a genetic condition. Testing throughout pregnancy may still be advised.

Embryo transfer

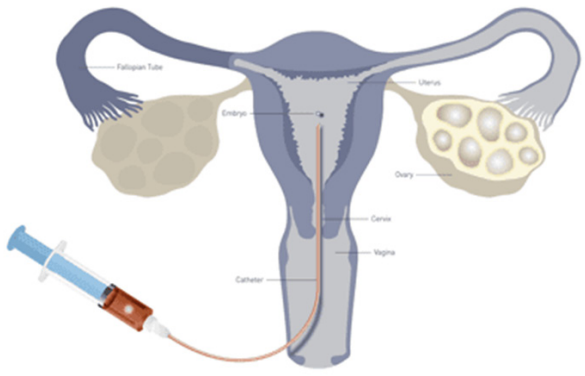

Figure 3: Embryo transfer

The embryo transfer is a basic procedure that does not need anaesthesia. Comparable to the sensation of a pelvic exam or Pap smear, it is gentle but thorough. A speculum is inserted into the vagina and a tiny catheter is threaded into the uterus. Embryos are held in a syringe at the other end of the catheter. Through the use of a catheter, the embryos are introduced into the uterus. The average time required to complete the process is around ten minutes. It usually takes around six to ten days after egg extraction for a successful embryo to implant in the uterine lining. Transferring embryos from one person to another is possible using either fresh or frozen embryos. The healthcare practitioner and the patient may determine which is best for their specific situation by discussing the usage of fresh or frozen embryos. The transfer procedure is the same for frozen and fresh embryos. A fresh embryo transfer includes putting an embryo into the uterus three to seven days following the ovum retrieval procedure. Frozen embryos (from a previous IVF cycle or donor eggs) are thawed and transferred into the client's uterus during a frozen embryo transfer. This treatment is more often performed due to practical factors and the increased possibility of a live delivery. Transfers of frozen embryos might take place years after fertilization and egg retrieval.

During the early stages of a frozen embryo transfer, hormones are supplied orally, injectably, vaginally, or transdermally to prepare the uterus for the embryo. This often requires taking medicine orally for 14-21 days before obtaining injections for six days. During this time, the client will have two or three appointments to have their uterus checked for readiness via ultrasound and to have their hormone levels measured via blood test. The client will be scheduled for the embryo transfer operation when the uterus is ready. If fresh embryos are to be used, the procedure is the same, but the embryos are transferred three to five days after they are harvested.

Risk

Following the catheter's insertion through the cervix, women may experience mild discomfort or vaginal spotting, or light bleeding. An infection is extremely rare and is typically treatable with antibiotics. Multiple pregnancies with more than one child—are more common with *in vitro* fertilization (IVF), especially when more than one embryo is transplanted. There are some serious dangers associated with these pregnancies which include:

- Premature children, whether conceived naturally or via IVF, are more likely to have health concerns such as lung development issues, intestinal infections, cerebral palsy, and cognitive challenges.
- Maternal hemorrhage
- Delivery by cesarean section (C-section)
- Pregnancy-related high blood pressure
- Gestational diabetes

After the procedure

Following the embryo transfer, the patient can go back to their regular daily routine. The ovaries could still be swollen, though. Avoid engaging in strenuous activities since it may be uncomfortable.

Common adverse effects include, mild bloating, mild cramping, constipation, breast pain from elevated oestrogen levels, and passing a tiny amount of clear or bloody fluid soon after the surgery because the cervix was swabbed before the embryo transfer. Any pain experienced following the embryo transfer should be reported to the doctor in order to rule out complications like infection, ovarian torsion, and severe ovarian hyperstimulation syndrome.

Results of IVF

The doctor will perform a blood test 12 days to two weeks following ovum retrieval to determine whether pregnancy has occurred.

If the pregnancy fails, the patient will cease taking progesterone and restart her menstrual cycle within a week.

If the patient becomes pregnant, the doctor will refer the patient to an obstetrician or other pregnancy specialist for prenatal care. The doctor may recommend actions to increase the client's chances of becoming pregnant through *in vitro* fertilization (IVF), if the patient is interested in trying another cycle of IVF.[25]

IVF Failure

Even though an IVF round that fails can be emotionally and financially painful, it is no longer assumed that infertile couples who undergo numerous rounds of IVF have a higher success rate. The quality of the sperms and eggs, the couple's compliance with instructions, and the clinic of choice are some of the elements that affect the overall effectiveness of IVF. Its failure may result from poor embryo quality, an unresponsive endometrium, or a malfunctioning combination of the two. IVF is a 50/50 proposition, but the optimal age to undergo it is 35 years or younger. Repetitive fibroids surgery can have an adverse effect on the uterine endometrium's quality.[26]

Environmental contaminants, which include, but are not limited to cosmetics, insecticides, fuel fumes, heavy metals, and food allergies, to name a few, have been found to be one of the limiting factors to successful fertility. We are regularly exposed to these chemicals in our daily lives, and it has an impact on our ability to procreate. One of the newest methods for cleansing the body before IVF treatment is Mayr therapy. This is especially beneficial for couples who have experienced multiple unsuccessful IVF cycles and inexplicable implantation failure.[27]

Challenges

Even as the use of IVF to treat female infertility increased, male infertility continues to be a barrier to overall success. Semen parameters below reference values for concentration (oligozoospermia), motility (asthenozoospermia), and morphology (teratozoospermia) significantly reduce the effectiveness of conventional IVF, leading to significantly lower fertilization rates and fewer embryos available for transfer.[28] Moreover, male azoospermiacs had no recourse whatsoever for treatment.

Impact of society on the experience of IVF therapy

The stigma attached to pursuing IVF therapy and the loss of masculine identity are two themes that illustrate how difficult it is for infertile couples, particularly men, to deal with cultural beliefs around the procedure.

Societal influence on IVF treatment experience

According to society view, pursuing IVF treatment is a sign of infertility.[29] Feelings of stigma are evoked by this as well as the societal expectation that married couples needed to have children. This is one of the additional reasons the couples chose to undergo IVF therapy in secrecy while closely preserving their medications and medical records. Additionally, they shun social interactions with friends and family while undergoing IVF therapy out of concern about stigma.

Loss of masculine identity

Men think that a man's job is to conceive his wife.[30] They feel as though they had let their spouses down by needing IVF treatment. This can lead to males feeling extremely inadequate and less manly, especially when combined with the underlying stigma around IVF

therapy. This consequently has a detrimental effect on their relationship with peers.

Feeling insignificant

Men experience a sense of insignificance during the IVF treatment due to interactions with the treatment personnel. They believe that their spouses receive preferential treatment and feel alienated from care, leaving their roles unclear.[29] The couple believes that the female partners are the main focus of the IVF procedure. Every aspect of their treatment plan, including their interactions with the IVF personnel, is focused on their partner. Men believe that there is no clear definition of the man's participation in the IVF treatment process. They believe that being responsible for paying IVF bills and giving semen is inadequate.

The financial burden

The expense of IVF is prohibitively expensive, causing the infertile couple a great deal of stress during the process, and they are forced to give up their properties in return for money to undergo the IVF. For some couples, this can result in mental tension and sadness.[31] In Nigeria, the average cost of an IVF cycle is N900,000, not including the price of any necessary auxiliary services, medications, or diagnostics.

Inadequate sensitization about IVF

The poor success rates of IVF and the processes of egg growth, semen generation, and embryo development outside the body are not fully understood by the couple pursuing the procedure. Because of this, insufficient information exists regarding the side effects of the medication used in IVF treatment. Numerous misconceptions regarding the procedure can been sparked by this, including the idea that having IVF will increase their partner's risk of developing cancer and having congenital defects.[29]

Fear of IVF treatment failure

IVF treatments are viewed by society as dangerous investments. They are believed to be associated with little chance of success and that the expense would be prohibitive.[29] Particularly those who had previously undergone IVF would be concerned about the emotional toll that another unsuccessful IVF attempt would take on them and their spouses. The incidence of genetic abnormalities in infants conceived using assisted reproductive technology is also 1-2 percent higher. However, it is unclear if this is because of the treatment itself or the issues that initially caused the infertility. Furthermore, as mothers and fathers age, certain genetic mistakes in gametes also rise. These factors, along with periods of decreased fertility that IVF can help with, raise the chance of genetic disorders in children born through IVF.

The health challenges

During the process of inducing ovulation, women may experience a variety of symptoms, including "mild bruising and soreness at the injection site (using different sites for the injections can be helpful), nausea, occasional vomiting, temporary allergic reactions, such as skin reddening and/or itching at the injection site, breast tenderness and increased vaginal discharge, mood swings, and fatigue".[32] Following ovum retrieval, a woman may have mild to severe haemorrhage, slight pelvic pain, and an infection. Additionally, she may experience mild to severe haemorrhage after implantation.

The socio-cultural challenge

Individual beliefs (e.g., infertility is a woman's problem alone), cultural sensitivity to fertility issues, and customs (e.g., waiting for natural conception or using herbal remedies frequently), all play a significant role in understanding the social and cultural norms surrounding infertility and the difficulties it causes. Women have expressed feelings of humiliation, disappointment, isolation, and oppression. The majority of infertile women think they cannot bear a childless life, and since most treatments are reserved for women, they are at a greater risk of harm than men.[33]

Conclusion and Recommendations

Because of today's assisted reproductive technology, seeking therapy for infertility is a possible option. Most infertile couples can enjoy the pleasures of motherhood with patience, optimistic attitude, and the right treatment. Therefore, it is recommended that couples view IVF therapy as a collaborative effort to increase the success rate, and that the female partner not be blamed or viewed as the cause for infertility. Surrogate moms should not be related to or maintain contact with the child's biological parents, and their decision should be supported by extensive counselling and legal documentation. Children born through IVF should not be referred to as bastards; instead, the family should view them as the parent's legal children. The government and health management organizations (HMOs) should provide insurance coverage for fertility treatments. New

technologies should be developed to lower the danger associated with IVF and the failure rate, with the goal of reducing infertility to an absolute minimum in our society. Society should be well-informed about IVF and all stigma associated with IVF should be eliminated. Nursing/midwifery students should be trained as *in vitro* fertilization specialists through monthly seminars or workshops to improve their knowledge on maternal and child health.

Conflict of interest

None

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