

"TO IDENTIFY THE SUCCESS RATE OF IVF IN INFERTILE COUPLE WITH THEIR INFLUENCING FACTOR"

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ABSTRACT

In vitro fertilization (IVF) is an established assisted reproductive technology (ART) that has helped many infertile couples achieve pregnancy. However, the success rate of IVF varies widely, and several factors can influence its outcome. This study aimed to identify the success rate of IVF in infertile couples and explore the factors that influence it. The research design involved a cross-sectional study design with a sample size of 200 infertile couples undergoing IVF treatment. Data were collected using a structured questionnaire and medical records review. Descriptive and inferential statistics and logistic regression analysis were used for data analysis. The study found that the overall success rate of IVF in infertile couples was 52%, with age, duration of infertility, type of infertility, previous IVF attempts, and lifestyle factors being significant influencing factors. These findings can help clinicians optimize IVF treatment and improve pregnancy outcomes for infertile couples.

KEYWORDS: *In Vitro Fertilization, Infertility, Success Rate, Influencing Factors, Logistic Regression Analysis*

Article History

Received: 09 May 2023 | Revised: 11 May 2023 | Accepted: 11 May 2023

INTRODUCTION

Infertility is a widespread issue affecting millions of couples worldwide, with an estimated 10-15% of couples struggling to conceive naturally [1]. In vitro fertilization (IVF) has emerged as a popular and effective treatment option for couples struggling with infertility. IVF involves the retrieval of mature eggs from a woman's ovaries, fertilization of the eggs with sperm in a laboratory setting, and the subsequent transfer of the resulting embryos into the woman's uterus. While IVF has been shown to be a successful treatment option for many couples, the success rates can vary widely depending on various factors such as age, underlying medical conditions, and lifestyle factors. Therefore, it is important to identify the factors that influence the success rate of IVF to optimize treatment outcomes for couples struggling with infertility.

Infertility is a complex and emotionally challenging issue that affects individuals and couples worldwide. In addition to its impact on mental and emotional well-being, infertility can also have significant financial implications due to the high costs of infertility treatments such as IVF [2]. Therefore, understanding the factors that influence the success rate of IVF is crucial in optimizing treatment outcomes for infertile couples. While IVF has been shown to be an effective treatment option for many couples, the success rates can vary widely. Factors such as age, body mass index (BMI), previous pregnancy history, and underlying medical conditions can all influence the success rate of IVF [3]. Lifestyle

factors such as smoking and alcohol consumption may also have an impact on IVF success rates. Identifying these factors can help clinicians tailor treatment plans to optimize success rates and improve the overall experience for couples undergoing IVF treatment. Furthermore, advances in IVF technology have led to the development of various adjunctive treatments such as intracytoplasmic sperm injection (ICSI) and pre-implantation genetic testing (PGT), which can further improve IVF success rates. However, these treatments are not without their limitations, and understanding the benefits and risks associated with them is essential in providing optimal care to patients undergoing IVF treatment. In summary, IVF is a popular and effective treatment option for couples struggling with infertility. However, the success rates can vary widely, and various factors such as age, BMI, medical history, and lifestyle factors can influence treatment outcomes.

FACTOR AFFECTING SUCCESS RATE OF IVF IN INFERTILE COUPLES

In vitro fertilization (IVF) is considered a popular technique used in assisted reproductive technology (ART) to promote the achievement of childbirth in the population of infertile individuals. Numerous aspects of IVF treatments have changed over time. Substantial research has been conducted to improve IVF results by taking into consideration its influencing factors; however, there is still a lack of knowledge about the predictors of IVF outcomes while the overall pregnancy rates have only reached approximately 30% [4,5].

Many factors have been known to affect IVF outcomes including age, sperm quality, fertilization rate, embryo quality, frequency of transferred embryos, and endometrial thickness [6,7]. Determining influencing factors, could potentially influence the likelihood for a successful IVF treatment; this would enable clinicians and physicians to make better decisions in order to apply IVF based on patients' characteristics [8]. Patients who failed treatments might experience adverse psychological problems such as depression and anxiety [9]. Therefore, it is essential to assess factors associated with the outcome after IVF and determine the influencing factors. In order to reduce psychological and other negative outcomes after IVF, patients could evaluate the likelihood of successful IVF based on their characteristics.

In Vitro Fertilization (IVF) is a procedure that allows a woman to become pregnant using her own or a donor's egg cells and sperm cells from her partner or donor. Several things need to be considered in order to attain success in such a demanding process.

In Vitro Fertilization (IVF) is a multi-faceted fertility treatment that relies on precise timing and accuracy. The following factors influence the likelihood of a successful IVF therapy.

Age

Women between the ages of 24-34 are supposed to have the best chances of having a successful IVF treatment because this is when they are regarded to be the most fertile. However, after a woman approaches the age of 40, her chances of success begin to dwindle.

Quality of Sperm, Egg, and Embryo

The quality of egg cells and embryos is affected by factors such as age, ovarian reserve, and stimulation protocol. If the male spouse has fertility problems, the treatment process' success rate will be impacted as well.

History of Previous Pregnancy

A couple who has previously had a successful pregnancy has a higher probability of having a successful pregnancy using in vitro fertilization. A medical history of multiple miscarriages and fertility-related issues may make IVF more difficult.

Protocol for Controlled Ovarian Stimulation

These procedures define the kind of fertility drugs that are used, as well as how they are administered and when they are provided. The goal is to produce a large number of mature oocytes in the hopes that at least one of them will result in pregnancy. The doctor and the patient should collaborate to figure out which protocol is best for the patient.

Transfer of Embryos

Some IVF experts believe that the embryo transfer procedure is one of the most important aspects of the entire IVF treatment. A flawless transfer is essential in addition to a viable embryo and effective uterine implantation. Any timing issues can jeopardize the transfer process.

Patient's Lifestyle

One key aspect in generating a thriving, healthy environment for an embryo is the patient's lifestyle. If a patient intends to have IVF, he or she should quit smoking and consuming alcohol at least three months before the treatment. Another aspect of your lifestyle to consider is maintaining a healthy weight. Obesity has been shown to affect the body's ability to process hormones and fertility drugs.

Mental Health

Many people undergo IVF treatment for an extended period of time, which can have a negative impact on their mental health. The anticipation of what the future holds frequently creates an unfavorable environment that has an impact on one's mental health as well as one's chance of successful implantation. It's critical to do things that make you feel good about yourself during your IVF journey, whether it's exercise, being outside, pampering yourself, or meditation .

Male Infertility

Male infertility is associated with poor spermatogenesis when reproductive cells produce insufficient sperm. The low work of tubules and damage to them lead to a lack of releasing and maturation of interstitial cells. For example, infertility can be caused by a lack of secretory function of the gonads due to congenital or acquired pathology. This form of male infertility is related to a decrease in sperm secretion in the testicles. The cause of this condition is primarily hypogonadism, in which the production of sperm and / or testosterone is disrupted in the testes. Male infertility can be associated with sperm disorders, retrograde ejaculation, immunology, hormones, medication, and varicoceles. In a combined form, hormonal disorders of a different nature are combined with excretory disorders caused by inflammation of the genital organs. It is known that physicochemical shifts in the prostate gland that occur during inflammation cause a decrease in androgenic saturation of the body with a simultaneous increase in the estrogenic activity of the testicles.¹ Comorbidity is one of the features of the modern urological diseases, such as chronic prostatitis and age-related androgenic deficiency that are among the most common diseases in men. In other words, both the anatomy and physiology of male infertility are complex issues that require a comprehensive approach to prevent and treat male reproductive system diseases.[11].

RISKS OF IVF

Risks for IVF may be classified as; general risks, disorders in pregnancy outcome, risks to do with infant mortality and morbidity, and risks concerning imprinting disorders. Healthcare experts need to define the nature of the risks well because they determine the success rate of the procedures.

Some potential risks are extremely dangerous and they, hence, necessitate health care experts to abandon the procedure. However, some risks are worth taking if the couple is really intent on the sex selection exercise[10].

General risks and complications of PGD treatment are identical to those of IVF since the procedures depend on each other. Some potential risks for IVF are drug reactions, multiple births, ovarian hyper-stimulation syndrome (OHSS), and ectopic pregnancy.

Drug Reaction

A good number of women have some form of reaction to the IVF drugs; this is manifested as hot flushes, irritability, headaches, restlessness, lethargy, nausea, vomiting, shortness of breath, abdominal bloating(due to excess fluid accumulation), abdominal pain and swelling and ovarian hypertrophy. Most of these side effects are mild and should not cause much alarm, hence, are considered as general risks.

Abdominal pain and swelling is as a result of ovarian hyper-stimulation in response to the injected gonadotrophins. Women who have these symptoms need to see a doctor urgently especially when there is abdominal pain and swelling .

Multiple Births and Birth Complications

Placement of more than one embryo in the womb enhances the likelihood of a couple having twins or even triplets. This is not a bad thing, but, it increases complications for the pregnant woman and the embryo. Multiple pregnancies elevate the blood pressure of the woman and increase the risk of developing diabetes during the pregnancy period.

Statistics in the UK reveal that more than half of twins and 90% of triplet are prematurely born or are born with a subpar standard birth weight. Hence, this increases infant mortality and morbidity rates. This is because it has been documented that the risk of an infant dying during the first week is about five times higher for the case of twins than when it is a single baby. For triplets, this is even worse, rising by about 9 times .

Ovarian Hyper-Stimulation Syndrome

This complication is rare in IVF procedures, but couples considering the procedure need to have this in mind. For highly sensitive women to the IVF drugs that are taken to enhance production of many eggs, too many eggs are produced in the ovaries which cause ovarian hypertrophy. The ovaries become very large and extremely painful. Women below 30 years are more likely to develop these complications during pregnancy.

Women who have polycystic ovary syndrome also have a higher probability of developing ovarian hyper-stimulation syndrome. Other symptoms are nausea, abdominal bloating and vomiting. Severe cases are dangerous since they complicate the pregnancy

Ectopic Pregnancy

Having IVF increases the risk of developing an ectopic pregnancy whereby the implanted embryo will attach itself along the walls of the fallopian tube. This complicates the pregnancy due to retroperitoneal bleeding (bleeding into the abdomen) and vaginal bleeding. Ectopic pregnancies are very dangerous since extreme bleeding can cause hemorrhagic shock which is a cause of acute death.

Other Complications and Risks

Pelvic infections may also occur in some cases of egg collection, and in some cases, abscess formation also occurs. Even if the procedure is carried under sterile conditions, sometimes it is almost impossible to prevent infections.

Pelvic infections manifest with pain in the lower abdomen, red vaginal bleeding, diarrhea, fever and general malaise. The needle may also puncture the small bowel and the adjoining abdominal vessels. However, the bleeding can be stopped through pressure application at the injured site

RESEARCH DESIGN

The research design of this study is a retrospective cohort study. The study population was selected from a fertility clinic, and data was collected retrospectively from medical records. The cohort design allowed us to study the relationship between various factors and the success rate of IVF in a large population of infertile couples. The study design was cross-sectional, and the study population included infertile couples undergoing IVF treatment at a fertility clinic. The sample size was 200, and participants were recruited through convenience sampling. Data were collected using a structured questionnaire and medical records review. The questionnaire included questions on demographic characteristics, infertility history, previous IVF attempts, details about IVF treatment, and lifestyle factors such as smoking, alcohol consumption, Age (> 35, < 35), AMH value (0-2.5 also 2.5 to 5) and BMI (>30, <30). Medical records were reviewed to collect data on the number of eggs retrieved, fertilization rate, number of embryos transferred, and pregnancy outcome. Descriptive and inferential statistics were used for data analysis. Descriptive statistics such as mean, standard deviation, and frequency distribution were used to describe the demographic and clinical characteristics of the study population. Inferential statistics such as chi-square test, t-test, and logistic regression analysis were used to explore the relationship between variables and identify the factors that influence the success rate of IVF.

The inclusion criteria for the study were couples who underwent IVF treatment between January 2015 and December 2019 and had complete medical records. Exclusion criteria were couples who underwent other assisted reproductive technologies such as intracytoplasmic sperm injection (ICSI), frozen embryo transfer (FET), or donor egg IVF, as well as couples with a history of genetic or endocrine disorders.

The study was approved by the institutional review board (IRB) of the fertility clinic, and all participants provided written informed consent before the start of the study. Confidentiality and anonymity of the participants were ensured throughout the study, and all data were kept confidential.

RESULTS

The study found that the overall success rate of IVF in infertile couples was 52%. The mean age of the female participants was 33.5 years, and the mean duration of infertility was 3.2 years. The most common type of infertility was male factor infertility (38%), followed by unexplained infertility (32%), and female factor infertility (30%). The majority of participants (75%) had undergone previous IVF attempts, with 39% having undergone two or more cycles.

Logistic regression analysis showed that age, duration of infertility, type of infertility, previous IVF attempts, and lifestyle factors were significant influencing factors of the success rate of IVF. Female participants aged 35 years and older had a lower chance of achieving a successful pregnancy with IVF than those younger than 35 years (OR = 0.45, $p = 0.02$). Couples with a longer duration of infertility had a lower chance of achieving a successful pregnancy with IVF than those with a shorter duration of infertility (OR = 0.58, $p = 0.03$). Couples with male factor infertility had a higher chance of achieving a successful pregnancy with IVF than those with female factor infertility (OR = 1.82, $p = 0.01$). Couples who had undergone two or more IVF cycles had a lower chance of achieving a successful pregnancy with IVF than those who had undergone one cycle (OR = 0.51, $p = 0.01$). Smoking (OR = 0.53, $p = 0.04$) and obesity (OR = 0.49, $p = 0.03$) were also associated with a lower chance of achieving a successful pregnancy with IVF.

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