

Success Rates and Complications of IVF: A Review of Current Evidence

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Abstract

In vitro fertilization (IVF) has changed the way reproductive medicine is done and given hope to millions of couples around the world who can't have children. IVF has some problems, even though it is used by a lot of people and its success rate is going up. This piece looks at the current success rates of IVF treatments around the world and talks about the most common problems that can happen during the treatment. It also talks about medical risks like ovarian hyperstimulation syndrome (OHSS), multiple pregnancies, and ectopic pregnancy, as well as factors that affect success, like the age of the mother, the health of the egg, and her lifestyle. Healthcare professionals need to have a deep understanding of these results in order to provide evidence-based guidance and support to patients who are thinking about or going through IVF.

Keywords: Vitro fertilization, Infertility, Hyperstimulation syndrome, Ectopic pregnancy.

Introduction

Infertility is a growing public health concern that affects approximately **10–15% of couples worldwide**, cutting across regions, socio-economic statuses, and cultures. It is defined as the inability to conceive after 12 months of regular, unprotected sexual intercourse, and can arise from male, female, combined, or unexplained factors. For many couples, the inability to conceive naturally leads to emotional distress, relationship strain, and psychological challenges. In response to this complex issue, the field of reproductive medicine has made tremendous advancements, with In vitro Fertilization (IVF) emerging as one of the most effective and widely used assisted reproductive technologies (ART) to help individuals and couples achieve parenthood.

IVF was first introduced to the world in **1978** with the birth of **Louise Brown** in the United Kingdom, marking a historic moment in medical science. The procedure has since undergone significant technological evolution, making it safer, more efficient, and more accessible. IVF involves a multi-step medical process that includes ovarian stimulation, egg retrieval, fertilization of the egg with sperm in a controlled laboratory environment, embryo culture, and finally, the **transfer of a viable embryo into the uterus**. If successful, the embryo implants in the uterine lining and develops into a pregnancy. IVF offers hope to individuals with various reproductive challenges, including blocked fallopian tubes, endometriosis, male infertility, ovulatory disorders, and unexplained infertility. It is also a critical option for same-sex couples and individuals wishing to conceive using donor gametes or surrogacy.

IVF success rates have gone up a lot over the years thanks to improvements in laboratory methods, cryopreservation, preimplantation genetic testing (PGT), and individual stimulation procedures. In spite of its promise, IVF does have some problems and risks. The process can be hard on the body, the mind, and the wallet. The results are very different based on things like the age of the mother, the quality of the baby, the reason for infertility, and the fertility clinic's experience. IVF can also lead to problems like ovarian hyperstimulation syndrome (OHSS), multiple births, ectopic implantation, and mental stress from going through multiple rounds or results that don't work. Clinicians, nurses, and patients need to know a lot about IVF success rates and problems in order to make smart choices about fertility care. This is because IVF is becoming more popular and has an effect on public health. IVF is a way for many people who might not have children otherwise to become parents, but it comes with mental, physical, and financial problems. This piece looks at new research on the success rates and problems that can happen during IVF treatments to give a full picture of how they work.

Success Rates of IVF

The success of IVF is typically measured by the live birth rate per cycle. According to the Centers for Disease Control and Prevention (CDC) and European Society of Human Reproduction and Embryology (ESHRE), success rates vary widely depending on multiple factors:

- **Maternal Age:** Women under 35 have the highest success rates, with live birth rates of 40–50% per cycle. This decreases to around 30% in women aged 35–37, 15–20% in those aged 38–40, and less than 10% in women over 40.
- **Embryo Quality:** High-quality embryos have a better chance of implantation and survival. Techniques like blastocyst transfer and preimplantation genetic testing (PGT) can enhance outcomes.
- **Number of Embryos Transferred:** While transferring multiple embryos may improve chances of pregnancy, it increases the risk of multiple gestations and associated complications.
- **Previous Pregnancies and Cause of Infertility:** Women with unexplained infertility or prior successful pregnancies have higher success rates.
- **Technological Advances:** Use of intracytoplasmic sperm injection (ICSI), time-lapse imaging, and frozen embryo transfers have improved outcomes.

Despite these advances, **overall global success rates** average between **30–40% per cycle**, and cumulative success may reach **60–70%** over 3–4 cycles.

Complications of IVF

Although IVF is generally safe, it carries certain medical and psychological risks.

1. Ovarian Hyperstimulation Syndrome (OHSS)

OHSS is a potentially serious complication caused by an excessive response to fertility drugs. Symptoms include abdominal pain, bloating, nausea, and in severe cases, fluid accumulation, thromboembolism, or kidney failure. OHSS occurs in about 1–5% of cycles and is more common in younger women or those with polycystic ovarian syndrome (PCOS).

2. Multiple Pregnancies

IVF significantly increases the likelihood of twins or higher-order multiples when more than one embryo is transferred. Multiple gestations are associated with increased risk of miscarriage, premature delivery, low birth weight, and maternal complications such as preeclampsia.

3. Ectopic Pregnancy

In 1–2% of IVF cases, the embryo implants outside the uterus, most commonly in the fallopian tube. Ectopic pregnancies require urgent intervention to prevent life-threatening complications.

4. Miscarriage

IVF pregnancies, especially in women of advanced age or with poor embryo quality, have slightly higher miscarriage rates compared to natural conceptions.

5. Birth Defects and Long-term Outcomes

Current evidence suggests a slightly increased risk of congenital anomalies in IVF-conceived babies, though the absolute risk remains low. Further studies are ongoing to determine long-term developmental outcomes.

6. Psychological and Emotional Stress

Couples undergoing IVF often face anxiety, depression, and emotional fatigue due to the invasive nature of treatment, repeated failures, and financial costs. Psychological counseling and support groups can play a crucial role in care.

Conclusion

In Vitro Fertilization (IVF) continues to serve as a beacon of hope for millions of individuals and couples struggling with infertility. Its increasing success rates, driven by technological advancements, refined stimulation protocols, improved laboratory techniques, and greater clinical experience, have revolutionized the landscape of assisted reproduction. However,

despite its promise, IVF is not without challenges. Complications such as Ovarian Hyperstimulation Syndrome (OHSS), multiple gestations, and the emotional and psychological toll of repeated cycles or failed attempts remain significant concerns. These risks underscore the importance of transparent communication and informed decision-making for those considering IVF.

To optimize outcomes and reduce complications, the adoption of individualized treatment approaches is crucial. Tailoring protocols to the patient's age, diagnosis, and hormonal profile can not only improve efficacy but also minimize unnecessary risks. Furthermore, **comprehensive counseling**—covering not just the medical aspects but also the psychological and ethical dimensions of IVF—is essential to prepare couples for the journey ahead. This includes discussions around embryo selection, the possibility of unused embryos, and the implications of multiple pregnancies. As IVF becomes increasingly mainstream, the integration of **psychological support, ethical guidance, and social counseling** into the treatment process is becoming vital. A **holistic and patient-centered approach**, grounded in empathy and clinical expertise, holds the key to enhancing the overall experience of IVF and ensuring that couples receive not only medical care but also the emotional resilience needed for a successful reproductive journey.

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