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Commentary

A Descriptive Study on *In Vitro* Fertilization and Reproductive Medicine

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DESCRIPTION

In Vitro Fertilization (IVF) has been a cornerstone of Assisted Reproductive Technology (ART) since the birth of Louise Brown, the world's first IVF baby, in 1978. Over the past few decades, IVF techniques and technologies have rapidly evolved, enabling millions of couples worldwide to overcome infertility challenges and fulfill their dreams of parenthood. In recent years, remarkable advances in IVF have further enhanced success rates, improved patient experience, and opened new possibilities for individuals and couples struggling with infertility. This article explores some of the ground breaking developments in IVF that are reshaping the landscape of reproductive medicine.

Preimplantation Genetic Testing (PGT)

One of the most significant breakthroughs in IVF is the development and widespread implementation of Preimplantation Genetic Testing (PGT). PGT enables the screening of embryos for genetic abnormalities before implantation, thus reducing the risk of inherited diseases and increasing the chances of a successful pregnancy. There are two main types of PGT: Preimplantation Genetic diagnosis (PGD) and Preimplantation Genetic Screening (PGS). PGD is used to detect specific genetic disorders, such as cystic fibrosis or sickle cell anemia, in embryos created through IVF. PGS, on the other hand, examines the chromosomal makeup of embryos to identify abnormalities associated with conditions like Down syndrome or Turner syndrome. PGT has revolutionized the field of reproductive medicine by empowering couples to make informed decisions about embryo selection, reducing the risk of genetic diseases, and improving the overall success rates of IVF.

Time-Lapse imaging and embryo scope technology

Another exciting development in IVF is the use of time-lapse imaging and Embryoscope technology. Traditionally, embryos were periodically removed from incubators for manual assessment, which disturbed the stable culture environment and exposed them to potential harm. Time-lapse imaging allows continuous monitoring of embryo development within the incubator without disturbing the delicate conditions. With the help of high-resolution cameras, Embryoscope technology captures images of embryos at regular intervals, enabling embryologists to observe their growth and select the most viable ones for transfer. This non-invasive approach minimizes disturbances and provides valuable information about embryo quality, leading to improved pregnancy rates and reduced miscarriage rates.

In Vitro Maturation (IVM)

In Vitro Maturation (IVM) is a ground-breaking technique that offers new hope to individuals who previously couldn't undergo conventional IVF due to conditions such as PolyCystic Ovary Syndrome (PCOS) or cancer. Unlike traditional IVF, which requires the use of hormonal medications to stimulate multiple egg maturation, IVM involves the retrieval of immature eggs from the ovaries and maturing them in the laboratory. This technique reduces the need for high doses of hormones, making it a more affordable and accessible option for many patients. IVM has proven to be a safe and effective alternative, resulting in healthy pregnancies and births, and it continues to evolve, with ongoing research aiming to further refine the procedure and expand its applications.

Single Embryo Transfer (SET) and elective freeze-all strategy

Historically, IVF often involved the transfer of multiple embryos to increase the chances of pregnancy. However, this approach carried a higher risk of multiple pregnancies, which can be associated with complications for both the mother and the babies. Recent advances have led to a paradigm shift towards Single Embryo Transfer (SET), where only one embryo is transferred to the uterus, reducing the risk of multiple pregnancies while maintaining good success rates. Additionally, the elective freeze-all strategy has gained popularity, where embryos are cryopreserved and transferred in a later cycle.

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