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Opinion Article

Technological Advancements of *In Vitro* Fertilization

Abha Tov*

Department of Obstetrics and Gynecology, IVF Unit, Barzilai Medical Center, Affiliated to Ben-Gurion University, Ashkelon, Israel

DESCRIPTION

The birth of Louise Brown in 1978 was the culmination of decades of scientific research in reproductive medicine. Since then, many advances in both clinical medicine and basic research have made it possible for more and more infertile couples to give birth to babies. Prior to 1978, women with non-functioning fallopian tubes were primarily considered infertility by doctors. Spontaneous fertilization of an egg cell by sperm *in vivo* requires at least one patented oviduct. In the past, many women with fallopian tube injuries relied on repair surgery or tuboplasty in the hope of restoring gamete passage. Unfortunately, these operations often failed. In the late 1970s, Leslie Browne, who suffered from nine years of primary infertility due to a fallopian tube obstruction, sought the help of Patrick Steptoe and Robert Edwards at the Oldham General Hospital in the United Kingdom. At that time, fertilization of *in vitro* egg cells, a process known as *In Vitro* Fertilization (IVF), was considered completely experimental and only resulted in miscarriage and fallopian tube pregnancy failure when attempted. Leslie Browne laparoscopically collected eggs without the use of medications to stimulate the ovaries. There she had her single egg fertilized in her laboratory and later returned to the womb. As a result of her embryo transfer, her first birth was given through IVF, her daughter Louise Brown, born in July 1978. Early ovulation due to the development of polyfolls has become a common problem with increasing use of hMG to induce fertility. Early elevation of luteinizing hormone has completed approximately 20% of the IVF cycle.

Egg donation

Early IVF advances have refined techniques for treating women with fallopian tube disease, but women with natural or early ovarian failure did not receive effective fertility drug treatment until 1983. In December of that year, a 25-year-old patient with secondary amenorrhea and primary ovarian insufficiency became the first person to successfully give birth using a donor egg. Dr Peter Renou of the Monash IVF Group in Australia fertilized a single egg donated by a 29-year-old patient who was undergoing IVF due to fallopian tube disease with sperm from the recipient's husband. The embryos were returned to the recipient's womb, resulting in a healthy term delivery. Over the last two decades, the main indications for egg donation have shifted from women with primary ovarian insufficiency to women who are predominantly older. The factors responsible for this trend are related to changes in the demographics of the entire population. More women postpone childbirth to pursue education and careers, marriages occur later in life, divorce and remarriage are more common, effective contraception and available abortion services are much desired eliminates no pregnancy.

Cryopreservation of embryos

The clinical and laboratory methods used in Assisted Reproductive Technology (ART) have evolved and improved, and surplus embryos beyond those used or needed for initial IVF treatment are becoming more and more common. In the early stages of in vitro fertilization, the options for patients with surplus embryos were to discard them, donate to another couple with infertility, or donate for use in experimental studies. Although cryopreservation of embryos was optional, the process of freezing and thawing often caused permanent damage to the cells and most embryos did not survive. This is best reflected in the very low pregnancy rates observed after frozen/thawed embryo transfer in the 1980s.

CONCLUSION

Few medical fields have experienced the popular growth and continuous improvement seen by physicians and their infertility patients. However, children pregnant with ART may be at higher risk of perinatal complications than children who are naturally pregnant, and there is increasing evidence that knowledge of the long-term health effects of ART is incomplete. Therefore, all clinicians and researchers involved in the care of these patients need to continue to raise awareness of these potential issues. As ART approaches thirty years, new and existing technologies need to be used responsibly so that infertile couples can reach their goals without compromising the principle of "do no harm first".

Correspondence to: Abha Tov, Department of Obstetrics and Gynecology, IVF Unit, Barzilai Medical Center, Affiliated to Ben-Gurion University, Ashkelon, Israel, E-mail: abha.tv@med.il

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