EDITORIAL

Robert Geoffrey Edwards
In vitro fertilization

Robert Geoffrey Edwards
La fertilización in vitro

Thirty-five years ago, the world saw Louise Joy Brown come into the world - the first child conceived through in vitro fertilization. Her birth was a widely broadcast international event that sparked deep ethical debates, and the changes it brought to the knowledge and understanding of human reproduction are still being felt today. But the birth on July 25, 1978 in the United Kingdom of that child, now a woman and mother of a 6-year-old boy, would not have been possible were it not for the restless curiosity and genius of Robert Edwards.

Sir Robert Geoffrey Edwards was the son of Samuel and Margaret Edwards and was born on September 27, 1925 in Manchester, England. He studied medicine at the University of Wales from 1948 to 1951.

In the 1950s, Robert Edwards got his degree in biology at the University of Edinburgh, where he began to carry out his studies on reproduction. He initially developed his technique in animals, and in 1955 presented his doctoral thesis on embryonal development in mice. The process of in vitro fertilization had first been studied in non-mammals in the middle of the nineteenth century, and nearly one century later it was demonstrated that mature rabbit ova could be fertilized by this technique and produce embryos. In 1964, or perhaps earlier, Edwards thought that the same process applied to animal material could be applied to human material. Because there was no Faculty of Medicine at Cambridge, making it difficult for him to have access to human material, in 1965 Edwards transferred to the Johns Hopkins Hospital as a resident. It was there that he carried out ovarian wedge resections as routine treatment for polycystic ovary syndrome, giving him access to a total of 20 to 30 ova per ovary resection. But it was not until 1968, after attending a conference given by the gynecologist Patrick Steptoe - in which he explained the procedure of obtaining the ova of a woman through the technique known as laparoscopy - that a productive collaboration between the two scientists began. They worked together for 10 years until they were able to achieve the satisfactory functioning of all aspects of the IVF-ET system, resulting in what is known today as in vitro fertilization.

In vitro fertilization is a technique that consists of placing an ovum in contact with 20,000-30,000 spermatozoa in a Petri dish and letting them incubate in a special culture medium until fertilization occurs. All this takes place under very controlled conditions of temperature, oxygen and carbon dioxide concentrations, humidity, and special culture mediums. The ova are obtained through ultrasound-guided transvaginal aspiration and the sperm cells can be obtained through masturbation, percutaneous aspiration of the epididymis, or testicular biopsy. The ova and sperm cells are then placed in culture mediums under the particular conditions necessary for fertilization and embryonal development to occur. Embryo transfer takes place within the first 6 or 7 days.

This therapy is indicated in infertility cases due to tuboperitoneal factor, endometriosis, male infertility, idiopathic...
or unexplained infertility, or immunologic factor; however, it is not a therapy that can be used in all cases. All of today’s therapies have special situations that contraindicate their use; such is the case with severe male infertility, defined as 1.5 million mobile sperm cells or less than 5 million spermatozoa per milliliter of semen, or sperm cells with less than 20% motility.

Not everything was always a success for the team that founded the world’s first fertility clinic, Bourn Hall Clinic. Edwards and Steptoe continued working to perfect the procedure; there was an ectopic pregnancy before the birth of the first “test tube” baby, the popular, though incorrect, moniker given to births conceived through assisted reproduction technologies.

Louise’s birth triggered development in the area of fertility, resulting in advances in the knowledge of the properties of sex cells in isolation and the consequent advent of new techniques such as intracellular sperm injection and the transfer of cytoplasm or nuclei from one cell to another for reproductive purposes, demonstrating that the union of bodies was not necessary for procreation. The number of participants in the reproductive process was modified, given that IVF currently allows for the participation of egg or sperm donors, opening the doors to sexual diversity and reproductive individuality, given that single women or individuals with different sexual orientations can have children. And above all, an alternative for the preservation of the species was obtained.

All the developments stemming from the contribution of this fertility genius led to his receiving different awards, such as the Albert Lasker Basic Medical Research Award in the year 2001; in 2007 his name appeared on the list of The Daily Telegraph naming the 100 most important living geniuses worldwide. But most certainly Edward’s greatest recognition was when the Nobel Assembly at Sweden’s Karolinska Institute awarded him the Nobel Prize in Medicine and Physiology on October 4, 2010, for his work in developing the in vitro fertilization technique, marking a milestone in the history of medicine and contributing to solving the fertility problems that affect 10%-15% of couples.

Robert Geoffrey Edwards died in his sleep on April 10, 2013, at the age of 87. It could be figuratively said that with his death, the father of more than 4,000,000 test tube babies also passed away.

And so today it is not possible to mention Robert Edwards without also speaking of in vitro fertilization. He will always be remembered for what he was - the genius who gave millions of persons worldwide the hope of experiencing biological parenthood.

References


N. Carrera-Laureán
General Surgery Speciality Residency (R1)
Hospital General de Zona N° 1, Colima, Col., Mexico

J. Guzmán-Esquivel*
Urology Service
Hospital General de Zona N° 1, Colima, Col., Mexico