

Uterus transplant and controversial assisted reproductive technologies: can the right to parenthood clash with ethical precepts?

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Abstract

Fast-developing assisted reproductive techniques based on innovative technologies have given rise to incredibly consequential ethical challenges of unprecedented scope. The development of innovative assisted reproductive technologies (ARTs) has steadily risen since the late 1970s. Until just over 20 years ago, those who sought to become parents had no way to overcome their infertility or sterility issues, but can now achieve parenthood and have children with at least a partial genetic and/or biological relationship. Treatments aimed at ovarian stimulation, artificial insemination, either by using the sperm of a husband or of an unrelated donor, in vitro fertilization with embryo transfer, gamete and zygote intrafallopian transfers, and intracytoplasmic sperm injection are among the options currently available. A major ethical quandary linked to ARTs is the one arising from unused embryos, i.e. supernumerary embryos which were not implanted. Still, aside from ethical concerns stemming from embryo rights, in such a fast-evolving field, a solid ethical foundation is absolutely necessary to provide guidance for regulations and legislation. This is especially true considering how assisted reproductive practices such as surrogacy and uterus transplant (UTx) are even more controversial, hence the need to rely on a broadly acknowledged and shared set of principles for their regulation, by virtue of their unique distinctive traits which challenge our ethical and moral compass at its very core. *Clin Ter 2021; 172 (5):e420-422. doi: 10.7417/CT.2021.2350*

Key words: assisted reproductive technologies, uterus transplant (UTx), research ethics, regulatory framework

Introduction

There is no denying that the unstoppable and fast growing development of reproductive techniques based on innovative technologies is posing ethical challenges of unprecedented and enormous magnitude. Innovative assisted reproductive technologies (ARTs) have made giant strides since the late

1970s, when Louise Brown became the world's first "test-tube baby", i.e. born through in vitro fertilization (IVF), on 25th July, 1978. Until just over 20 years ago, those who sought to become parents, including individuals in so-called traditional male-female marriages, unmarried adults, post-menopausal women, and same-sex partnerships, had no way to overcome infertility or sterility issues, but can now fulfill their aspirations to have children with at least a partial genetic and/or biological relationship.

Multiple ART options and ethical concerns

Treatments aimed at ovarian stimulation, artificial insemination, either by using the sperm of a husband or of an unrelated donor, in vitro fertilization with embryo transfer, gamete and zygote intrafallopian transfers, and intracytoplasmic sperm injection constitute a partial list of options with varying degrees of complexity, invasiveness, and financial costs (1). A major ethical quandary linked to ARTs has to do with unused embryos, i.e. supernumerary embryos which were not implanted (2, 3). Still, aside from ethical concerns arising from embryo rights, in such a fast-evolving field, a solid ethical foundation is absolutely necessary to provide guidance for regulations and legislation.

Uniformity in framing well-balanced regulations is key

This is especially true considering how assisted reproductive practices such as surrogacy and uterus transplant (UTx) are even more controversial, hence the need to rely on a broadly acknowledged and shared set of principles for their regulation (4-6). UTx undoubtedly constitutes a remarkable innovation in the realm of assisted reproductive technologies, and has been described as a new type of quality of life enhancing, as well as a "life-giving" transplantation (7). UTx research has been conducted for over 50 years, and the first successful transplant was performed in 2000 from a living donor in Saudi Arabia. The first birth from a transplanted womb occurred in 2014 (8). UTx is not a life-saving

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procedure, but rather one solely aimed at enabling women with uterine factor infertility (UFI) to achieve motherhood through the gestational component, and possibly even having a genetic connection with their children. In addition, women who have suffered major complications from the exertion of fundal pressure or Kristeller's maneuver (9), uterine rupture during induced labor (10, 11), other adverse outcomes such as infections (12), or other even more catastrophic developments (13) may be able to rely on UTx to restore their child-bearing capability. In the interest of a thorough ethical analysis, it is worth bearing in mind that UTx, as the first ephemeral transplant (i.e. temporary, since a postpartum hysterectomy will be performed soon after delivery, in order to avoid continuing immunosuppression and related complications), is unique in that it entails the difficulties and challenges of both ART techniques and those arising from organ transplantation. Compared to surrogacy or adoption, the main objective pursued through UTx is the experience of pregnancy. Nonetheless, such an experience will be different for UTx recipients than for patients who naturally conceive and bring a pregnancy to term. In fact, although the patient will experience symptoms such as morning sickness, bloating and enlarged uterus, the sensation of contractions or fetal movement will likely not be the same, due to the impossibility to anastomose nerves (14). Given the experimental nature of UTx, it is essential to carry out a thorough informed consent process. The American Society for Reproductive Medicine has stressed in a 2018 committee opinion that recipients must be thoroughly counseled regarding the risks, both known and unknown, inherent in this experimental procedure (15). UTx is also unique compared to other organ transplants in light of its involving two human beings: the mother and the child yet to be born. The safety aspect is therefore even more relevant. Although the immunosuppressive regimen has never been found to be teratogenic, high-quality research data are still unavailable. In addition to the medical difficulties and ethical complexities linked to UTx, there are many regulatory concerns as well. In light of the fact that UTx poses the challenges of both assisted reproductive technology as well as organ transplantation, although it does not exactly belong in the realm of assisted reproductive technologies nor transplant medicine. Moreover, since UTx is not life-saving or life-extending, usual standards regulating organ transplantation may be difficult to apply. In the United States, for instance, access to transplants is regulated by the United Network for Organ Sharing (UNOS) according to three fundamental standards: sickest first, prognosis of the recipient, and the first-come first-served (16). How such principles could be applied to UTx is still unclear. It is therefore of utmost importance to have a comprehensive discussion centered around the ethical, legal, and social implications before such a technique can transition from research to mainstream widespread clinical practice. Such a discussion needs to involve all stakeholders, from scientists to patients, regulatory officials and policymakers, in order to make sure that the best balance can be achieved for the sake of public health and to uphold the reproductive rights of as many people as possible (17). Given the reproductive and transplant aspects of UTx, there is some uncertainty as to which bodies of law may regulate the procedure, in light of its unique characteristics;

still, such uncertainties should not affect the patients who may choose to resort to such procedures to solve (UFI) and fulfill their wish to achieve parenthood. Italy has witnessed firsthand how difficult it can be to frame and enact well-balanced legislation on ethically moot, divisive issues such as medically-assisted procreation (18-20).

Conclusions

Such difficulties and regulatory inconsistencies have at times ended up damaging the stability and well-being of the children born in transnational surrogacy agreements (21), or created a conflict between the right of anonymous gamete donors to keep anonymity and that of children to find out about their biological origins (22-27). Such outcomes add to the substantial ethical quandaries posed by assisted reproductive technologies (28). In the medium term, UTx is likely to provide a viable alternative to adoption or gestational surrogacy, hence a thorough risk-benefit analysis needs to take into account such alternative paths as well. While relying on a deceased donor would be less ethically controversial (the donor would obviously suffer no consequences), the risk of infection and transplant rejection has been found to be higher when the uterus of a deceased donor is used in the procedure, probably because of the vascular and anatomical changes taking place after death (29-30). The complexities which we have attempted to briefly elaborate on are emblematic of the way technologies outpace legal, moral and ethical core values. That discrepancy is certainly going to give rise to more and more conflicts between what can be done and what is acceptable by us as human beings with a moral compass, particularly in the extremely sensitive area of health care, which entails life and death decisions.

Conflict of interest: The authors declare that there is no conflict of interest regarding this manuscript.

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