

Ectogenesis: Artificial Womb Technology – A Women’s Beyond Choice

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Abstract: *In 2017, a Philadelphia research team revealed the closest thing to an artificial womb (AW) the world had ever seen. The ‘biobag’, if as successful as early animal testing suggests, will change the face of neonatal intensive care. At present, premature neonates born earlier than 22 weeks have no hope of survival. For some time, there have been no significant improvements in mortality rates or incidences of long-term complications for preterms at the viability threshold. Artificial womb technology (AWT), that might change these odds, is eagerly anticipated for clinical application. We need to understand whether AWT is an extension of current intensive care or something entirely new. This question is central to determining when and how the biobag should be used on human subjects. This paper examines the science behind AWT and advances two principal claims. First, AWT is conceptually different from conventional intensive care. Identifying why AWT should be understood as distinct demonstrates how it raises different ethico-legal questions. Second, these questions should be formulated without the ‘human being growing in the AW’ being described with inherently value laden terminology. The ‘human being in an AW’ is neither a fetus nor a baby, and the ethical tethers associated with these terms could perpetuate misunderstanding and confusion. Thus, the term ‘gestateling’ should be adopted to refer to this new product of human reproduction: a developing human being gestating ex utero. While this paper does not attempt to solve all the ethical problems associated with AWT, it makes important clarifications that will enable better formulation of relevant ethical questions for future exploration. This is an open access article distributed in accordance with the Creative Commons Attribution 4.0 Unported (CC BY 4.0) license, which permits others to copy, redistribute, remix, transform and build upon this work for any purpose, provided the original work is properly cited, a link to the licence is given, and indication of whether changes were made.*

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I. INTRODUCTION

Ectogenesis

We would also sensibly prohibit ectogenesis. That is, we would prohibit the development of an embryo in the laboratory beyond some specified number of days. British law prohibits development of an embryo beyond day 14 (Human Fertilisation and Embryology Act 1990, ch. 37, §3[3] [a]). Some have taken the laying down of the primitive streak as the first stage in the development of a nervous system. But the nonindividuation objection has become the most influential reason for adopting day 14 as a boundary. The demise of the nonindividuation objection would explode that rationale. Still we shall have to set some boundary if we wish to preclude ectogenesis. As Bernard Williams once remarked, it is not uniquely reasonable that we draw a line at 14 days, but it is reasonable that we draw it (Williams 1986). Likewise, it might also go one step ahead and prohibit AWT from giving birth to a child by limiting the use of AWT to protect premature babies and for infertile parents or single parents. However, it is likely to affect the rights of women who do not want to reproduce. AWT would also lead to an increase in illegal sale, purchase, export, and import of gametes and embryos, which needs to be dealt with as an offence and strict penalties need to be imposed to prevent any such malpractice. Further, for single parents, it needs to be maintained that the person who donates their sperm/eggs respectively to help that single parent will have no relation with the child born out of AWT.



The legislators can bring In AWT within the ambit of contracts in a similar way it covers surrogacy. The contract between clinics providing AWT and parents hiring artificial womb should be made enforceable, as per the Indian Contract Act so that when any dispute arises, the matter can be settled easily without any harm to the child born out of the artificial womb. It can also establish authorities at the state level monitored and controlled by an apex central authority. The state authorities would keep a check on the AWT clinics in a specified area and also maintain a register containing data of all the parents opting for AWT and children born out of the same. With this, the commodification of children would get restricted to a considerable extent.

The legislators should consider the child developing inside the artificial womb as a ‘child developing inside the natural womb of the mother’ to provide equal control to the mother that she possesses while pregnancy. The appropriate provisions of the Medical Termination of Pregnancy Act should be applied in the most suitable way to deal with the abortion of such children by shifting the emphasis from women’s control over their bodies to the right to have control over parenthood destiny to protect the right to abortion. AWT is certain to happen, thereby sooner or later, the policies and laws must be equipped to deal with it. Predicting the future circumstance and bolstering the dynamic nature of the law, India must legislate an ART Act covering AWT before it is actually put into practice.

Artificial Womb Technology (AWT)

This technology is being designed to enhance the treatment mechanisms for severely premature newborns. The process of growing a baby outside the natural womb is known as gestation ex utero (ectogenesis), which is used for the development of premature babies. Partial ectogenesis is already in practice where premature babies are transferred from the natural womb of the mother to humidicribs for the continuation of their growth. However, the upcoming AWT would not only limit itself to facilitate premature children, but it may even provide a platform to parents to hire artificial wombs, like they hire womb of any other woman in surrogacy, to carry the foetus on behalf of them.

In 2017, where a premature lamb spent four weeks in an artificial womb made up of plastic bag containing amniotic fluid where it grew normally, and in 2019 where AWT broke its 4-minute mile by maintaining an extremely preterm lamb foetus (equivalent to the 24-week human foetus) with the help of an EVE platform (an artificial placenta-based life-supporting platform) bolster the claim that soon after the advent of artificial wombs, it would become as common as In Vitro Fertilization and surrogacy. Moreover, it may potentially affect natural human procreation as it offers an alternative for women to bypass the pain that they suffer during the delivery of a baby

Advantages of AWT

The advantages of AWT are similar to that of any other assisted reproductive technology as it provides an alternative for infertile couples to bear a child. Further, it would also provide a simple way for single men and gay/lesbian couples to become parents rather than opting for surrogacy or any other method. It would also help fertile women, who, for personal or health reasons do not prefer to/or are unable to bear a child. For instance, a working woman has to compete at her workplace and also take care of her family and the same not only takes a toll on her physical health but also

affects her mental health. Thus, carrying a child would exacerbate her situation. However, the AWT is likely to mitigate such issues.

Furthermore, an artificial womb can provide an optimum environment for the foetus to develop. If the woman faces any serious health hazard after getting pregnant, the foetus can be shifted to an artificial womb in order to protect the life of the child in utero, thereby continuing its development without any risk to its physical health. Moreover, AWT would also make it easier to perform foetal surgeries, if needed. Thus, AWT might act as a linchpin in protecting the foetus as well as saving the healthcare expense of families that they bear due to premature births of babies and other external risks.

AWT: Ethical and Legal Issues

The first ethical issue that AWT would pose is the rise in inequality among the wealthy and the poor in society. The rich may prefer AWT that would affect the income of the pharmaceutical industry, doctors, and hospitals. As a consequence, the prices of medicines and other devices and fees of the doctors and hospitals would increase, which would in turn severely affect the poor strata of society. As this technology is likely to be very expensive, at least in the initial years, the economically backward sections of the society might altogether be deprived of access to such facilities. Differences between nutrition level and exposure to pathogens would also increase among the children of wealthy and poor strata of the society as AWT would provide the appropriate amount of nutrients and hormones artificially for the development of the foetus in the artificial womb, and the foetus will also be free from any external risks.

Some consider AWT as being against the natural process of human procreation. Further, even though AWT would provide an alternative for women to bear children, it is also likely to affect the dynamics of parenthood. In today's scenario, women have some control over their pregnancy as they bear the child. However, this would change when foetus can survive equally outside the body. It would offer a new form of equality to both the mother and father of the foetus. AWT would also snatch away the right to abortion from women. The right to abortion is an amalgamation of three rights viz. right not to be a gestational parent, right not to be a legal parent, and right not to be a genetic parent. Women are likely to get compelled to gestate the baby through an artificial womb due to family pressure, which would violate their second and third rights under the right to abortion. As a result, the pro-life activists are welcoming this process as an alternative to abortion.

Furthermore, the parents in dispute might also abandon the baby, the way they abandon the children born out of surrogacy. There also exists a risk of 'commodification' as clinics providing artificial wombs might indulge in the sale and purchase of children. With the help of AWT, parents can also observe their foetal development in real-time. In India, gender discrimination is already prevalent at the mass level as parents prefer sons over daughters. Thus, it might give a boost to such ill-practices suppressed by the legislations since 1994. These issues need to be taken seriously as it would not only affects the rights of women and children but also pose a threat to the social fabric which binds the society together.

Bioethical Consideration

The development of artificial uteri and ectogenesis raises a few bioethical and legal considerations, and also has important implications for reproductive rights and the abortion debate.

Artificial uteri may expand the range of fetal viability, raising questions about the role that fetal viability plays within abortion law. Within severance theory, for example, abortion rights only include the right to remove the fetus, and do not always extend to the termination of the fetus. If transferring the fetus from a woman's womb to an artificial uterus is possible, the choice to terminate a pregnancy in this way could provide an alternative to aborting the fetus.

There are also theoretical concerns that children who develop in an artificial uterus may lack "some essential bond with their mothers that other children have";[20] a secondary issue to woman's rights over their own body.

In the 1970 book *The Dialectic of Sex*, feminist Shulamith Firestone wrote that differences in biological reproductive roles are a source of gender inequality. Firestone singled out pregnancy and childbirth, making the argument that an artificial womb would free "women from the tyranny of their reproductive biology."

History

In 2017, a team of researchers at the Children’s Hospital of Philadelphia kept a pre-viable lamb fetus alive for four weeks in an amniotic sac, one designed to imitate the womb from which the developing embryo had been prematurely plucked. The fetus’ pumping heart facilitated the exchange of nutrients and other growth factors between the lamb and its environment. Researchers watched as the fetus developed in this artificial environment from a pink, alien-looking thing into a breathing, swallowing animal.



As news of the artificial womb spread, some suggested that the medical device—designed to eventually help severely premature human babies—was a step toward a future imagined by Aldous Huxley in his 1932 novel *Brave New World*. Huxley depicts a world in which embryos are fertilized in test tubes, chemically arranged into hierarchical socio-biological groupings from Alphas (who go on to take the most important roles in society) to Epsilons (a slave caste who work in large crematoriums, mining phosphorous from burnt human remains), and then brought to term in a “hatchery.” So controversial and influential was Huxley’s vision that, even today, almost 90 years later, any technology that supports the life of a fetus outside the womb is almost inevitably linked with his dystopia. An artificial womb is taken as a signifier of a technologically stratified future, one in which we give up our last and most profound connection to evolutionary history, to our animal ancestors, and to each other.

But what many don’t know is that Huxley’s dystopia was actually the end-point of a decade-long debate among some of Britain’s most prominent scientists and philosophers about the possibilities and dangers of artificial wombs. Due to the scientific advances of the time, many of these eminent thinkers believed that this revolutionary technology was just around the corner. And while for Huxley this was a terrifying prospect, for many of his more radical contemporaries, it was just the opposite.

Limitations

By providing mechanical ventilation administering oxygen using external pumps to aid circulation and nasogastric feeding but the traditional incubators remained interventions in facilitated infants. Even though the use of AWT would be expansive from protecting premature children to giving birth to a healthy child, situations described above along with some unprecedented issues would mushroom. To deal with such circumstances, the AWT needs to be treated as an Assisted Reproductive Technology (ART) under any special law or amended legislation. The definition of ART as mentioned in the 2020 Bill needs to be expanded to include an ‘artificially developed’ reproductive system of women to cover AWT. Moreover, it can be foreseen that special clinics would be set up to provide the facilities of AWT to the public at large. These clinics can be regulated legally hand-in-hand with the clinics providing for ART.

II. CONCLUSION

The Government of India has banned commercial surrogacy and the production of children through surrogacy for sale, prostitution, or any other form of exploitation. Likewise, it might also go one step ahead and prohibit AWT from giving birth to a child by limiting the use of AWT to protect premature babies and for infertile parents or single parents. However, it is likely to affect the rights of women who do not want to reproduce. AWT would also lead to an increase in illegal sale, purchase, export, and import of gametes and embryos, which needs to be dealt with as an offence and strict penalties need to be imposed to prevent any such malpractice. Further, for single parents, it needs to be maintained that the person who donates their sperm/eggs respectively to help that single parent will have no relation with the child born out of AWT.

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