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Abstract: The medicalisation of pregnancy and childbirth has been encouraged by the continuing growth of technology that can be applied to the reproductive journey. Technology now has the potential to fully separate reproduction from the human body with the prospect of ectogenesis- the gestation of a foetus outside of the human body. This paper considers the issues that have been caused by the general medicalisation of pregnancy and childbirth and the impact that ectogenesis may have on these existing issues. The medicalisation of pregnancy and childbirth is criticised for its impact on the relationship between doctors and pregnant women and the way in which doctors treat foetuses. It is argued that ectogenesis may cause more imbalance in the doctor and intended parent relationship and may result in an increased lack of clarity regarding a doctor's duty to the foetus. This paper finds that extensive guidance and revised legislation will be necessary to minimise the impact of ectogenesis on the existing issues caused by the medicalisation of reproduction.

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INTRODUCTION

Technical innovations have changed the landscape of reproduction in fundamental ways. From the ability to view a foetus in an ultrasound image to the creation of an embryo in a petri dish, reproductive technologies have expanded not only how we view pregnancy (quite literally) but also how pregnancy comes to be. Along with these new technologies is the increased involvement of medical professionals from pre-conception to birth. The use of technology and the amplified involvement of medical personnel have led to the medicalisation of pregnancy and childbirth. This paper adopts the concept of medicalisation as explained by Søren Holm, in that the human activities of pregnancy and childbirth are now controlled by the medical profession and handled as medical conditions to be monitored and treated.[1] As will be shown throughout this paper, medicalisation can harm pregnant women by causing them to distrust their own bodily sensations, reduce their autonomy in decision making and increase the tension between maternal and foetal needs.

The medicalisation of pregnancy and childbirth appears to have resulted from two main changes in obstetric services. Firstly, obstetricians began to take over responsibility for normal as well as complicated births,[2] usurping the role of community midwives.[3] This greater presence of obstetricians also encouraged the move of pregnancy from the home to the hospital.[4] Secondly, the development of prenatal technologies and findings from neonatal research opened up new access to the foetus for obstetricians.[5] These two changes created two main issues in obstetric care. Firstly, changes in the exchange of information

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between a pregnant woman and her doctor has impacted the relationship between them. Secondly, technology has impacted how a foetus is treated in a clinical setting. Both of these issues will be explored further in this paper.

Whilst the medicalisation of pregnancy and childbirth was predominantly born from technologies that allowed a foetus to be viewed, monitored and accessed by doctors, the scope of reproductive technologies has now expanded. Technologies such as in-vitro fertilisation, oocyte retrieval, preimplantation genetic diagnosis and mitochondrial donation, mean that, for some women, more of the reproductive process is taking place in medical settings. These assisted reproductive technologies have too been subject to criticisms of medicalisation, with claims that they create solutions to issues that were never previously deemed clinical problems.[1]

Research focused on saving the lives of premature babies could lead to more extreme reproductive technology such as partial and full ectogenesis.[6] Partial ectogenesis involves an embryo beginning its gestation inside the womb of a woman and then, during the gestational period, being transferred to an artificial womb to continue its gestation. Full ectogenesis, on the other hand, involves an embryo being implanted directly into an artificial womb and completing its full gestation in this environment. This technology will go further than any before by separating the reproductive process from the human body and making the

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foetus and woman two distinct entities. This paper will consider how this innovative technology will impact the issues raised by the medicalisation of pregnancy and childbirth.ⁱ

RELATIONSHIP BETWEEN DOCTORS AND PREGNANT WOMEN/INTENDED PARENTS

Knowledge and risk

The increased presence of obstetricians and the introduction of technology to prenatal care altered the management of pregnancies and in turn, the relationship between doctors and pregnant women. Prior to ultrasounds and prenatal tests, information regarding foetal health was gained from a description of bodily symptoms provided by the pregnant woman.[5] However, as technology has provided obstetricians with access to the foetus, the information exchange between doctors and pregnant women has changed. Whilst women could retain some authority regarding bodily symptoms, many pregnant women now seek out the technologies for assurance of foetal health.[7-8] They rely on obstetricians and other healthcare professionals to interpret and relay the results of scans and tests in order to provide them with knowledge of their foetus. Therefore, any authority that the pregnant woman has in the doctor-patient relationship is undermined by the technology, which can alienate women from the management of their pregnancies. With the expanded knowledge that prenatal technologies provide, the expertise regarding the foetus has shifted from the pregnant woman

ⁱ Whilst the legal arguments in this paper are specific to a UK context, the implications of ectogenesis on the general issues surrounding the medicalisation of pregnancy and childbirth are considered to be applicable in all contexts whereby technology forms a part of maternity care.

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to the doctor, making women more dependent on doctors to confirm the status of changes occurring within their own bodies.

The increased presence of obstetricians is also claimed to have resulted in more pregnancies being deemed as a risk and consequently pregnancy has become more monitored and controlled.[9] As a result, fixed medical timeframes have been applied to pregnancies, allowing doctors to dictate when pregnancy begins and ends.[10] These timeframes are used to justify further technological interventions when the medical timings are not being conformed to.[10] A standard pregnancy and childbirth “norm” has thus been created,[11] which ignores the variability of the experience for different women and has again made women reliant on doctors to confirm if their pregnancy is developing “normally”. Empirical studies have found that women feel pressured to comply with both medical and social expectations of accepting an induction when becoming overdue.[12] They feel they have little choice in the management of the prolonged pregnancy with induction assumed to be inevitable.[12] A study by Emily Ross further indicated that women question bodily sensations in the early stages of pregnancy if they do not align with medical timelines, as well as the experiences of family and friends.[13] Therefore women are further reliant on doctors as they become influenced by a medical model of pregnancy.

The introduction of ectogenesis could exacerbate these issues and cause women and other intended parents to feel like they have even less authority in the doctor-patient relationship. In cases of partial ectogenesis, the information exchange between doctors and pregnant women is unlikely to be much different during human gestation. However, once the foetus is

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transferred to an artificial womb, the woman is likely to become more reliant on the doctor for information regarding foetal health as she will no longer have any physical connection to it.

Similarly, in cases where the foetus is fully gestated externally, there is little information that the woman can provide to the doctor, since her body is no longer engaged. In both full and partial ectogenesis, an artificial womb is likely to be a medical and technological minefield to lay people.ⁱⁱ Whilst it is expected that doctors would have more expertise in medical technology, the lack of understanding, in addition to no physical connection to the foetus, may exacerbate feelings of alienation from the reproductive process. With the balance of expertise shifted in this way, doctors may feel they have more authority in the relationship. Ectogenesis may also provide doctors with more control regarding timeframes as the development of the foetus will no longer be restricted by a human body. Again, more expertise will be placed with doctors as they become increasingly familiar with the development of the foetus and intended parents once again rely on their expertise.ⁱⁱⁱ

Prenatal testing

A further issue resulting from medicalisation has been raised by Emily Jackson, who argues that the development of more accurate diagnostic tests have led to a trend towards routine

ⁱⁱ The biobag used to support premature lambs required a pumpless oxygenator circuit, closed fluid circuit and umbilical vascular access. An understanding of the workings of an artificial womb are likely to require more than the average understanding of the process of human gestation.

ⁱⁱⁱ For those without access to ectogenesis, the issues surrounding the medicalisation of pregnancy may still be exacerbated as more knowledge is gained regarding foetal health. However, further discussion of this point is beyond the scope of this paper.

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prenatal testing.[9] The routine nature of such testing raises concern over whether women are in fact consenting to the tests and if so whether they know what it is they are consenting to.[14] The amount of information that can be collected through prenatal tests has expanded and the tests themselves have become less intrusive. For example, detecting genetic or chromosomal conditions in a foetus through amniocentesis involved inserting a needle into the abdominal wall of the pregnant woman in order to extract amniotic fluid. Such a procedure carries a small risk of miscarriage and can be uncomfortable for the pregnant woman.[15] However, non-invasive prenatal testing can now detect the same conditions, and potentially many more,[16] in the maternal blood stream, with a blood test being taken at an earlier stage in the pregnancy. Whilst the discomfort is reduced for pregnant women and the earlier results can provide more options for women in relation to termination decisions,[16] there is concern that the ease of the test can result in an assumption being drawn that all women will consent to it.[16] This further alters the dynamics between doctors and pregnant women, as all women come to be treated the same as opposed to individuals with variable needs and desires.

Whilst the type of testing and procedures available with ectogenesis are not yet clear, full ectogenesis, in particular, may eliminate some of the physical concerns regarding consent as a woman would not need to subject herself to treatment or tests for the sake of the foetus. However, if there is no longer any discomfort to a third party, and the risks are proven to be relatively small for the foetus, any refusal of testing from the intended parents may be harder to defend. They may therefore feel pressured into proceeding with recommended testing. This

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could also apply to cases involving partial ectogenesis, as some testing may become available that was not possible during human gestation.

Consent issues may also still arise when it comes to the intended parents understanding information being presented. Having intended parents fully understand the intricacies of an artificial womb and the treatment and testing options available through this technology could be difficult and as a result they may not understand if and what options are available. This, along with the potential pressure to comply, may result in intended parents, much like pregnant women, feeling in a weaker position to the doctors, resulting in them consenting to testing and procedures presented as routine.^{iv}

Expectations

Technology may have further impacted the relationship between women and doctors by increasing the expectations of medicine. Richard Johanson *et al* suggest that as science advances, the belief that the medical profession can solve all ills or prevent all disasters increases.[2] As a result, they claim that the increased medicalisation of pregnancy and childbirth is a result of defensive practice by doctors.[2] Due to the elevated expectations of pregnant women, doctors may be exercising excess caution and overusing available technologies. Heather Cahill has further suggested that the visibility of these technologies

^{iv} There is the possibility that a different decision-making model could be applied to ectogenic foetuses, depending on their legal status, discussed later in the paper. Whilst the different models that may be applied are beyond the scope of this paper, a model that would not require parental consent would subvert the concerns raised regarding informed consent. I am grateful to the reviewer for raising this issue.

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provides “proof” of the maternal and foetal care being delivered and as such both the public and politicians are reassured as to the use and allocation of resources.[17]

If ectogenesis is promoted as a healthier alternative to natural gestation for some women, which in itself has wider political implications,[18-21] a belief that more medical difficulties can be overcome may be encouraged. As a result more disputes may arise between doctors and intended parents when it comes to treatment decisions, as parents try to insist that more can be done.[22] For full ectogenesis, parents may have higher expectations for the health of the foetus if it was presented as safer than human gestation and with partial ectogenesis, women may try to demand that their foetuses be transferred to an artificial womb to improve prognosis for identified medical conditions. The breakdown in relationship between doctors and families has previously been evidenced in court proceedings,[23] and a recent briefing note from the Nuffield Council on Bioethics has indicated that a feeling of powerlessness by parents can contribute to the strained relationships.[25] Feelings of powerlessness may be exacerbated by a lack of understanding of the functioning of the artificial womb and therefore relationship breakdowns may increase between intended parents and healthcare professionals.

Information provision

The provision of information to the intended parents prior to any engagement with ectogenesis will be essential to limit the concerns outlined above. This may take the shape of preparation classes, much like antenatal classes, and if ectogenesis becomes a mainstream option for gestation, the function of artificial wombs may also form part of sex education

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classes in schools.^v Providing the information prior to any use of the technology reduces the occurrence of situations whereby intended parents need to digest complex information in a time-pressured and stressful situation. In order to manage expectations, discussions should also focus on the limitations of ectogenesis. This will be particularly pertinent for early users of ectogenesis, during which the limitations may still be under review.

The next part of this paper considers the impact of medicalisation on the treatment of a foetus in a clinical setting and how this may be influenced by ectogenesis.

TREATMENT OF A FOETUS

Foetus as a second patient

As well as a change in the relationship between doctors and pregnant women, the observational technologies have altered the doctor's relationship with the foetus. The ability to look inside the womb has been said to have encouraged the foetus to be viewed as a separate entity, disassociated from the pregnant woman.[5, 26] As a result the foetus has come to be treated as a second patient during pregnancy and childbirth.[5] The range of foetal surgery that can now be carried out further encourages doctors to view themselves as providing treatment directly to the foetus as opposed to the pregnant woman.[5] Treating the foetus as a patient is also likely to be driven by a doctor's knowledge that should they injure the foetus as a result of negligence and the foetus goes on to be born alive, the doctor can be sued for the injuries.[27] This may further account for the defensive use of prenatal

^v I am grateful to Dr Rita D'Alton-Harrison for both suggestions.[24]

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technologies discussed above. This medicalisation of the status of the foetus could potentially be damaging to the autonomy of pregnant women, as their desires may be overshadowed by the needs of the foetus.

Tensions relating to a foetus being treated as a patient by doctors are driven by the foetus' position within a pregnant woman. As ectogenesis presents an opportunity for the foetus and woman to be separated, it may be argued that treating an externally gestated foetus as a patient would not be controversial.^{vi} Any treatment provided to the foetus would not physically impact the woman and there would be no need to balance the foetus' needs with the bodily integrity of another. It therefore appears that ectogenesis could provide a solution to foetal status in the medical setting as a doctor can pursue their duty of care towards the foetus as a patient.^{vii}

Legal status of the foetus

Termination

Despite a potential status as patient, legally a foetus is not considered a person nor is it judged to have any interests.[28-29] However, viability is considered to have a significant impact on the legal status of foetuses. In England, Wales and Scotland, aborting a foetus after 24 weeks gestation requires satisfying more stringent grounds under the Abortion Act 1967.[30-32] A woman can seek an abortion prior to the 24 week threshold but on more easily satisfied

^{vi} This sets aside any other potential conflicts regarding treatment decisions. The potential models of decision-making for ectogenic foetuses are beyond the scope of this paper.

^{vii} This may have implications for those pursuing human gestation but they are beyond the scope of this paper.

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grounds.[33] The 24-week threshold was previously set at 28 weeks but was amended when the Human Fertilisation and Embryology Act 1990 came into force, as a result of the increased survival of premature babies. Therefore, viability appears to impact the legal protection applied to a foetus.

Frida Simonstein has argued that, if foetuses can be gestated independently from their mothers then, with the availability of ectogenesis, all foetuses will be considered viable.[34] As a result, all foetuses may be entitled to legal protection, thereby enhancing their legal status. This is likely to impact doctor's involvement in abortion decisions as the Abortion Act 1967 imposes a legal duty on doctors to determine whether the criteria for an abortion have been met.[35] Whilst it may be questionable whether this requirement is strictly adhered to in practice, women seeking an abortion prior to 24 weeks gestation may nevertheless find doctors less willing to consider the grounds satisfied if they feel that the foetus requires protection due to the viability that ectogenesis offers it.[36] This may further limit women's autonomy in termination decisions and as a result, women may feel coerced into participating in partial ectogenesis if this is the only support their doctor will provide them with.

In order to avoid women turning to backstreet abortions,[37] many academics only support ectogenesis if it exists alongside natural pregnancy.[38-39] Whilst this may ensure reproductive autonomy for some women, the co-existence of pregnancy and ectogenesis may prove difficult for doctors in practice. Doctors may find that they are able to provide treatment options to an ectogenic foetus that they cannot provide to an *in vivo* foetus because of its implications for the pregnant woman. They may therefore feel a frustration and

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disparity in how they are treating their “patients”. In addition, since the Abortion Act 1967 relies on limits of viability and the impact of the pregnancy on the pregnant woman, it is questionable how it could be applied to a request to terminate an ectogenic foetus.[40] The Act is therefore likely to require reform or new legislation will need to be drafted specific to the treatment of an ectogenic foetus. The creation of such legislation is likely to require lengthy consultation which may be reflective of the Warnock Committee when determining the status of embryos.[41]

Liability

The legal status of an ectogenic foetus will also impact a doctor’s liability for negligence. Under current legislation, the ectogenic foetus must be considered born in order to make a claim against the doctor. Arguments have been made for an ectogenic foetus to be treated the same as a new born, regardless of whether it has been partially or fully gestated externally,[42] whereas others have claimed that it should be treated as an entirely different entity.[43-44] These arguments rest on different interpretations of live birth. Alternatively, Eric Steiger suggests that legal status should be dependant on a developmental stage.[45] The merit of each of these arguments is beyond the scope of this paper, but it is clear that current understandings of birth as a mark of legal personhood may result in illogical outcomes with ectogenesis. Doctors could owe a duty of care to foetuses who have been partially gestated in an artificial womb but may never owe a duty to a foetus who is fully gestated externally, because it has never existed within its mother.[45] Therefore, the concept of birth may

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require revision as the legal status of an ectogenic foetus is essential to doctors understanding the extent of their duty of care.

Guidance

Whilst ectogenesis appears to lighten the conflict of duties to mother and foetus, the existence of both natural pregnancy and ectogenesis raises new challenges for doctors in their treatment of a foetus. Should ectogenesis, in any form, translate to clinical practice, clear legislation and guidance will be necessary for doctors to ensure that they uphold a fair and appropriate standard of care for all patients.

Conclusion

Technology has played a distinctive role in the medicalisation of pregnancy and childbirth and has impacted the relationship between doctors and pregnant women as well as doctor's treatment of foetuses. With research paving the way to ectogenesis, pregnancy and childbirth may no longer be necessary in the gestation of future generations. In exploring the impact of ectogenesis on the medicalisation of reproduction, this paper has found that the relationship between doctors and intended parents may lead to further imbalance and disputes. To avoid this, extensive consultation and information sharing would have to take place before ectogenesis is utilised. Additionally, this paper indicates that whilst ectogenesis could reduce the conflict between the treatment of pregnant women and foetuses, it generates additional conflicts between doctors and their patients. If pregnancy and ectogenesis co-exist, doctors will need to adjust their duties accordingly and issues of abortion provision and liability for

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negligence will remain unresolved without revised legislation. Therefore, the impact of ectogenesis on the issues arising from the medicalisation of reproduction can only be minimised if effective guidance and legal frameworks are put in place.

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