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Brain death during pregnancy and prolonged corporeal support of the body: A critical discussion

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ABSTRACT

Aim: To discuss corporeal support of the brain-dead pregnant woman and to critically examine important aspects of this complex situation that remain as yet unexplored.
Background: When brain death of the woman occurs during pregnancy, the fetus may be kept inside the corporeally supported body for prolonged periods to enable continued fetal growth and development. This has been increasingly reported in medical literature since 1982 and has received considerable media attention in the past few years.
Implications for midwives and nurses: Sophisticated advances in medical technologies have altered the boundaries of conception and birth, life and death, Western biomedical and cultural conceptions of women and their bodies, fetal personhood, fetal rights and fetal patienthood, profoundly influencing maternal behaviors, medical decisions and the treatment of pregnant women. This is especially so in the rare, but fraught instance of brain death of the pregnant woman, where nurses and midwives working in High Dependency Care units undertake the daily care of the corporeally supported body that holds a living fetus within it. This discussion enables critical and ethical conversation around the complexities of developing appropriate discourse concerning the woman who suffers brain death during pregnancy and considers the complexities for nurses and midwives caring for the Woman/body/fetus in this context. The potential impact on the fetus of growing and developing inside a 'dead' body is examined, and the absence in the literature of long-term follow up of infants gestated thus is questioned.

Statement of significance

Problem

Case studies in the medical literature reporting prolonged corporeal support of the body of the brain dead (BD) pregnant woman demonstrate the considerable complexity of care, use of resources and cost involved in aiming for the birth of a live viable infant, yet aside from ethical debate, little is written about this fraught and complex situation.

What is already known

The bodies of BD pregnant women have been corporeally supported since 1982 for prolonged periods (2 days–107 days) solely to enable fetal growth and development. With 37 cases reported to date, literature has either focussed on the ethics of this act, or detailed the technical aspects and complications of high dependency care used to stabilise a BD body to gestate a fetus with the aim of achieving the birth of a live and viable infant.

What this paper adds

This article raises compelling questions for further consideration around BD in pregnancy and points to new research areas for exploration of this complex and fraught context. These include: the lack of appropriate terminology/discourse used to describe the woman/body/fetus, the need for qualitative research that examines nurses' and midwives' experiences of caring for the BD body and the fetus, discussion of potential consequences for fetal growth and development inside a dead body, and the need for detailed long-term follow-up of infants gestated thus.

1. Introduction

When a woman died during pregnancy or childbirth in pre-modern times, the fetus was excised from the body via a procedure

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known as *sectio in mortua* (cutting in death), as soon as possible after death was determined to enable salvation of the fetal soul, and proper burial for the woman and the infant.[1,2] In this article, we discuss the determination of BD and differentiate it from other forms of brain injury/death. We then examine medical literature and media reports from 1989 to 2016 relating to the practice of keeping the fetus inside the body of the woman who has suffered BD during pregnancy, achieved by what could be considered a new reproductive technology: namely, prolonged corporeal/somatic maintenance of the maternal body solely for fetal life support until excision of the infant via what is technically a post-mortem Caesarean section. We consider the problematic terminology used in the media and medical literature used to discuss the woman/body/fetus in this context, and the complexities faced by nurses and midwives caring for them. Additionally, we question important points relating to the lack of a defined or accepted gestational age 'limit' at which prolonged corporeal support of the BD body is commenced, specifically; the woman's body state and the care of that body, the growth and development of the fetus inside an inert, unresponsive, unstable and legally lifeless body, and the dearth of literature relating to long term outcomes for infants so gestated.

2. Physical death and brain death of the pregnant woman

In the industrialised world as in pre-modern times, the determination of death provokes multiple social, cultural, emotional, religious and legal responses.[3,4] In today's technocratic age the beginnings of life have been manipulated by medical technology,[4] and the meaning of death has been reworked and reordered.[5–7] When the person who dies is a pregnant woman, this is further complicated by moral and ethical quandaries, because inside the pregnant body is a fetus able to be maintained and 'salvaged', to use a term common in the medical literature. Much depends on the gestation at which the event occurs, the death 'state' of the woman (cardiac/physical or BD) and the state of the maternal body when death is declared. Incidences such as these involve massive physical trauma to the body, or massive trauma to the brainstem. Examples of the former include pregnant women who suicide (e.g., by jumping from windows or bridges), or who suffer massive physical trauma, as did a young Australian woman, Sarah Paino, who, at 32 weeks pregnant, died from horrific injuries received in a motor vehicle accident that occurred in January 2016. Declared dead at the scene, her body was transferred to a nearby hospital where a live male infant was excised via post-mortem CS.[8] Examples of the latter include pregnant women who suffer brain injury, such as a stroke,[9] sub-arachnoid hemorrhage[10] or anoxia[4,11] causing BD but leaving the body intact. These tragedies reveal issues not found in any other medical context around death (except perhaps organ procurement) and beg compelling questions about life and death, and life *in* death. The context of BD during pregnancy where the body of the woman is functionally maintained for prolonged periods solely to support fetal life is perhaps most complex, as it exposes what is increasingly being done to the body of a dead woman because she is pregnant.

3. Defining brain death

It is important to distinguish between coma, a persistent vegetative state and BD, as BD confers the person as legally dead (See Table 1). The Australian and New Zealand Intensive Care Society[12] explains that BD is distinguished by irreversible unresponsive coma, and an combined with absence of brain-stem reflexes and respiratory center function. Further, for BD to be diagnosed, clinical or neuro-imaging evidence of acute brain pathology must be demonstrated which is consistent with irreversible neurological functional loss.[12]

For all intents and purposes a BD person is considered dead, legally and physically.[13] The criteria currently used to determine BD were devised in the United States in 1968 by the Harvard Ad Hoc Committee in response to ethico-legal issues around organ procurement for transplantation.[14] At the time they were devised, the intended use of corporeal support of a body was short-term, prior to organ retrieval. When BD occurs in a pregnant woman, however, the decision is knowingly made to functionally support the body for a prolonged period to enable growth and development of the fetus in utero at least until fetal viability, and at most to prolong the gestation as far beyond fetal viability as possible, to optimize fetal survival with the aim of delivering a live infant.

Table 1
Differentiating between coma, persistent vegetative state and brain death.

Condition	Features	Possible causes	Legal status
Coma	Patient unarouseable, non-responsive to stimuli, never conscious while comatose Probability of waking and outcomes depend on etiology[15] Continuous absence of eye-opening (spontaneously or following stimulation), no evidence of visual fixation, absent voluntary motor behaviour, behavioural responses limited to reflex activity[4,16]	Origin may be traumatic or non- traumatic: includes metabolic disorders, infection, structural lesions anywhere in brain/ brainstem, trauma, overdose, stroke, post-anoxic coma, poisoning[15,17]	Alive[17]
Persistent Vegetative State	No awareness or ability to interact with others, no language or purposeful responsive behaviour to a range of stimuli[4] Limited facial expression, able to breathe independently, intermittent 'wakefulness' that may be accompanied by grunting, groaning, screaming, frequent non-purposeful movements, incontinence, brainstem reflexes preserved, able to regulate vascular tone and temperature[4] Rare occurrences of awakenings[18]	Haemorrhagic stroke, ischaemic stroke, meningitis, epilepsy, cardiac arrest, traumatic brain injury, metabolic disorders, neurodegenerative conditions[18,19]	Alive[4,16,17]
BD	Irreversible loss of all brain function, absence of all brain stem reflexes, coma—never conscious, absent motor response, unable to regulate vascular tone or temperature, mute, 1 in3 cases demonstrate limited reflex movements generated by residual spinal activity[4] Apnoea[4,16]	Massive traumatic injury, intracranial hemorrhage, cardiac arrest, anoxia[4]	Dead[4,16]