Executive Summary – Consequences of Abortion

Biological, Behavioral and Physiological Consequences of Drug-Induced Pregnancy Termination at First-Trimester Human Equivalent in an Animal Model

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Published in *Frontiers in Neuroscience*, 29 May 2019 doi: 10.3389/fnins.2019.00544

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Highlights

Pregnancy termination using ***mifepristone*** (RU-486) and ***misoprostol*** led to:

- A reduction in overall well-being
- Depression-like behavior
- Anxiety-like behavior
- Physiological changes to the oxidative stress system
- A removal of the benefits on fertility associated with pregnancy and giving birth.

- The changes observed were relatively long-term and reflected moderate to severe stress.
- The behavioral effects seen following chemical abortion were NOT observed in rats that miscarried naturally.
- The changes observed were clearly associated with the drug administration leading to **abortion** and not simply drug-administration.

Background:

Approximately 20% of all pregnancies in the U.S. end in abortion. The health implications of abortion on women continue to be a source of heated debate. Various health concerns, resulting from abortion, have been reported: short- and long-term, including physiological (e.g. increased risk of cancer) and psychological effects (e.g. increased risk of mood disorders (including depression), anxiety, substance abuse, and suicide).

Given the seriousness of the potential mental health and physical consequences, and the difficulty of treating them if they occur, it is necessary to appropriately investigate these potential links to the abortion procedure. Unlike many other situations in medicine, there has not been any objective pre-clinical investigation of the potential serious physiological consequences of the termination of a viable pregnancy. Given the complex changes in the body associated with pregnancy, it is difficult to expect that terminating a viable pregnancy is without consequences.

Goal and Experimental Design:

While there are clear differences between animals and humans, there are many similarities in the physiology, neurology, neurophysiology and the resulting behaviors (e.g. in stress). Animal models provide scientists with a comparative approach to address various questions (e.g. depression, schizophrenia, etc.), at various levels (e.g. behavioral, neurophysiological, molecular, etc.), in a significantly more controlled environment, independently of potential social, moral and other influences.

The goal of the study was to provide a pre-clinical investigation of the potential biological, physiological, and behavioral consequences of induced abortion in an animal model (a laboratory rat). The measures we used are established measures that have been determined to represent similar behaviors in humans under certain conditions.

What we measured, what we saw, and what it means:

	Measure	What it Measures	Observation	Interpretation
A.	**Body Weight**	Measure of health and well-being	Significant negative changes in **body weight.**	Reduction in overall **well-being***
B.	**Food Intake**	Measure of health and well-being	Significant negative changes in **food intake**	Reduction in overall **well-being***
C.	**Vaginal Impedance**	Measure of fertility	A significant reduction in the amplitude of the **vaginal impedance** peaks	A reduction in **fertility**; An absence of the protective effects of pregnancy to full-term
*not observed in naturally miscarrying rats				
	Measure	**What it Measures**	**Observation**	**Interpretation**
D.	**Sucrose Consumption**	Decrease = anhedonia	A significant reduction in **sucrose consumption**	Anhedonic effect = **Depression-like behavior**
E.	**Locomotor Activity**	Exploratory behavior; Decrease = depression-like behavior	Significant changes in the various aspects of measured **behavior**	**Stress/Depression-like behavior**
F.	**Corner Activity**	Exploratory behavior	Increased immobile time in back corner of testing cage	**Anxiety-like behavior**
G.	**Biochemical Observations**	Oxidative Balance	Abortion group different from both Drug-or Pregnant- only group	**Long-term oxidative stress**

Note:

- The **depression-like** behavior was comparable to moderate to severe stress
- The well-being of the rats in the abortion group was significantly different **(lower/worse)** than those in the **natural miscarriage** group.

Conclusion:

The findings of this study appear to:

- indicate that drug-induced pregnancy termination (at first-trimester human equivalent) in the rat induces **significant negative biological and behavioral effects**, and **long-term physiological changes**.
- provide additional support to the current literature suggesting benefits in carrying a pregnancy to full-term and delivering and the potential absence of such beneficial effects following a pregnancy termination.
- indicate a significant difference between induced pregnancy termination (abortion) and natural miscarriage.
- indicate the importance and necessity for further objective research into the abortion procedure, including at the physiological and neurophysiological levels. Such work may further our understanding and potentially shed some clarity into the potential biobehavioral impact of such a procedure at the level of the human person.

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