

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

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To download full text of research study:

<https://www.frontiersin.org/articles/10.3389/fnins.2019.00544>

Highlights of the Study – Technical version

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.

Why do we need to study abortion?

- Approximately 20% of all pregnancies in the U.S. end in abortion.
- The health implications of abortion on women continues to be a heated debate.
- There are many health concerns about abortion, e.g., increased risk of cancer, increased risk of depression, anxiety, substance abuse, and suicide.
- Given the seriousness of the potential consequences, and the difficulty of treating them if they occur, it is important for us to have as much information as possible about the effects of abortion on the body, the brain and behavior.

How do the drugs in abortion work?

- First drug - Mifepristone: blocks progesterone; terminates the pregnancy
- Second drug- Misoprostol: causes contractions to expel the baby.

What this study showed

- In the rat, inducing abortion using mifepristone and misoprostol caused **significant depression- and anxiety-like effects**, in addition to **long-term physiological changes**.

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Technical Summary of 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 <u>body weight</u> .	Reduction in overall well-being*
B. Food Intake	Measure of health and well-being	Significant negative changes in <u>food intake</u>	Reduction in overall well-being*
C. Vaginal Impedance	Measure of fertility	A significant reduction in the amplitude of the <u>vaginal impedance</u> 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 <u>sucrose consumption</u>	Anhedonic effect = Depression-like behavior
E. Locomotor Activity	Exploratory behavior; Decrease = depression-like behavior	Significant changes in the various aspects of measured <u>behavior</u>	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.