

Are ART patients more vulnerable to persistent postpartum mood symptoms in the face of adverse neonatal events?: Results from the NICHD PregSource® Project

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Background: Postpartum mood disorders (PMDs) are a common complication of pregnancy, but there is mixed evidence on whether assisted reproductive technology (ART) patients are at greater risk. While adverse neonatal events (ANEs) are a strong risk factor for persistent PMD, it is not known if patients with pregnancies conceived via ART are more psychiatrically vulnerable or resilient to these events.

Objective: To compare the incidence of persistent PMD symptoms among patients with spontaneous and ART-conceived pregnancies, and the effects of ANEs on PMD risk in these groups.

Materials and Methods: Analysis of data from the PregSource® Project, an NICHD initiative to crowdsource pregnancy data collection via online and mobile platforms. Patients in the ART-conceived group self-reported use of ovulation induction, intrauterine insemination, or in-vitro fertilization. ANE was defined as a composite outcome of preterm birth (< 34 weeks), NICU admission, or stillbirth. Patients with persistent PMD symptoms reported severe depression, anhedonia, or anxiety at ≥ 1 month postpartum. Effects of ART-conception, ANEs, and their interaction on persistent PMD risk were modeled using logistic regression analysis.

Results: Of 1,377 unique patients in the PregSource® database, 357 patients completed postpartum mood surveys, including 321 spontaneous and 36 ART-conceived pregnancies. ART patients were older than patients with spontaneous pregnancies ($p = 0.00002$). There were no differences in rate of pregravid mental illness between spontaneous and ART-conceived pregnancies. ART-conceived pregnancies had a higher rate of NICU admission (25.0% vs. 11.5%, $p=0.04$), but there was no significant difference in composite ANEs (25% vs. 13.1%, $p=0.09$). Postpartum mood symptoms were more frequent in ART-conceived pregnancies, but not significantly so (22.2% vs. 13.7%, $p=0.26$).

In pregnancies without an ANE, the rate of persistent PMD symptoms was 11.1% (31/279) in spontaneous pregnancies and 18.5% (5/27) for ART-conceived pregnancies ($p = 0.41$). Following an ANE, the rate of persistent PMD symptoms was similar in spontaneous and ART-conceived pregnancies: 30.9% (13/42) vs. 33.3% (3/9), respectively ($p = 1.00$).

On multiple logistic regression analysis, pregravid mental illness (OR 3.67, 95%CI 1.98-6.93) and ANEs (OR 2.19, 95%CI 1.57-7.69) were strongly associated with risk of PMD symptoms, but ART-conception was not. There was not a significant interaction effect between ART-conception and ANEs on PMD risk (OR 0.71, 95%CI 0.09 - 5.10).

Conclusions: Adverse neonatal events (ANEs) were a strong risk factor for persistent severe postpartum mood disorder (PMD) symptoms, and were more common among ART-conceived pregnancies. However, patients with ART-conceived pregnancies are not more vulnerable or resilient to these events.

Table 1: Baseline characteristics, obstetric outcomes, postpartum mood symptoms in spontaneous vs. ART-conceived pregnancies

	Spontaneous (n = 321)	ART-conceived (n = 36)	P-value
Age (mean, sd)	36.9 (4.0)	40.9 (4.8)	0.00002
Race/Ethnicity (n, %)			
Hispanic	18 (5.6%)	0 (0%)	0.29
White	299 (93.1%)	35 (97.2%)	0.78
Black / African-American	6 (1.9%)	1 (2.8%)	
Asian / Pacific-Islander	8 (2.4%)	0 (0%)	
Multiracial	6 (1.9%)	0 (0%)	
Other	2 (0.6%)	0 (0%)	
Pregravid mental illness (n, %)	104 (32.4%)	12 (33.3%)	1.00
Parity (mean, sd)	1.2 (1.4)	1.6 (1.8)	0.32
GA at delivery (weeks) (mean, sd)	39.0 (3.2)	38.4 (1.8)	0.17
Multiple gestations (n,%)	5 (1.6%)	2 (5.6%)	0.31
Cesarean delivery (n,%)	86 (26.8%)	14 (38.9%)	0.18
Adverse Neonatal Event (n, %)			
Birth at < 34 weeks GA	7 (2.2%)	1 (2.7%)	1.00
NICU admission	37 (11.5%)	9 (25%)	0.04
Stillbirth	3 (0.9%)	0 (0%)	1.00
Composite	42 (13.1%)	9 (25%)	0.09
Postpartum mood symptoms (n, %)			
Severe depression	25 (7.8%)	5 (13.8%)	0.35
Severe anhedonia	17 (5.3%)	4 (11.1%)	0.30
Severe anxiety	31 (9.7%)	7 (19.4%)	0.12
Composite	44 (13.7%)	8 (22.2%)	0.26

Figure 1.

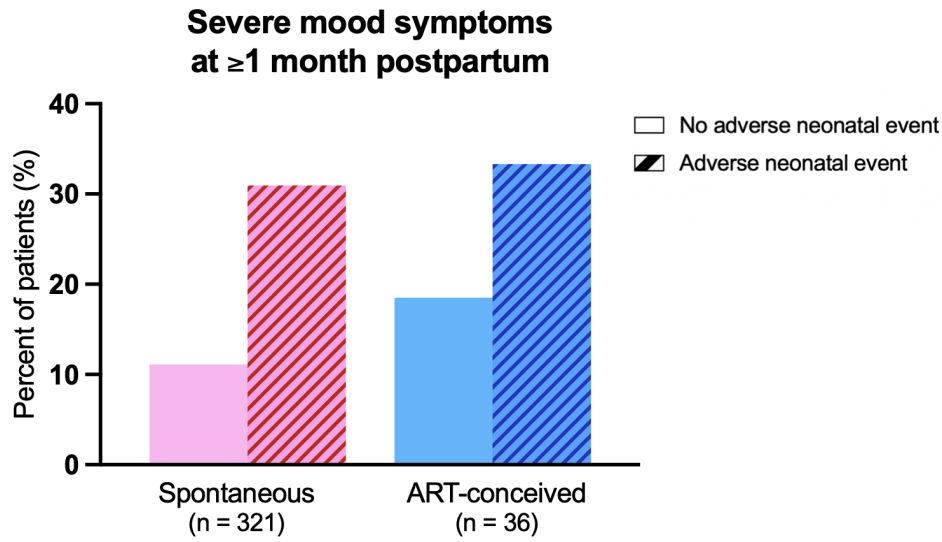


Table 2. Multiple logistic regression of postpartum mood symptom risk

Parameter	Odds Ratio (96% C.I.)	P-value	
Age (years)	0.95 (0.99 - 1.02)	0.17	n.s.
Pregravid mental illness	3.67 (1.98 - 6.93)	0.000049	***
ART-conception	2.19 (0.66 - 6.33)	0.17	n.s.
Adverse neonatal event	3.52 (1.57 - 7.69)	0.0018	**
ART x ANE interaction	0.71 (0.09 - 5.10)	0.73	n.s.