Maternal Mental Health Disorders May Increase the Odds of Adverse Intrauterine and Birth Outcomes

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BACKGROUND

- Congenital heart defects (CHD) are the most common congenital deformity, affecting approximately 40,000 births per year in the US[1] and occur at a constant incidence globally[2]
- Various combinations of genetic and secondary contributors have been proposed, and researchers continue to explore additional predictors of CHD causation

OBJECTIVES

This study aimed to evaluate whether there is a relationship between maternal mental health disorder (MMHD) history and the incidence of abnormalities in fetal heart rate or rhythm as well as the incidence of adverse birth outcomes

METHODS

- We queried a de-identified US electronic health record database (Cerner Real-World Data) for patients aged 18 to 44 who had a delivery-related visit between February 1, 2019 to February 1, 2020
- Both ICD-10 codes **(Table 1)** and medication history were used to identify patients who have previously been diagnosed with mental health disorders
- Medications of interest included benzodiazepines, selective serotonin reuptake inhibitors, antipsychotics, and mood stabilizers

METHODS (Cont'd)

- Outcomes of interest were (1) stillbirth, (2) presence of abnormal fetal heart rate or rhythm, (3) need for maternal care due to fetal heart/rhythm abnormalities, (4) complications of labor and delivery, (5) maternal care for suspected fetal abnormality and damage, all identified by ICD-10 codes
- We calculated odds ratios with 95% confidence intervals to assess risk between MMHD and/or medication use history and each outcome of interest

Table 1. ICD-10 codes used to identify mental health disorder history

Condition	ICD-10 Code(s)
Anxiety	F41.0, F41.1, F41.3, F41.8, F41.9, F43.22, F43.23
Major Depressive Disorder	F32.X, F33.X, F33.4X, F34.1
Schizophrenia	F20.X
Bipolar Disorder	F31.X
Posttraumatic Stress Disorder	F43.1X

RESULTS

- Out of 421,767 births, 100,297 were to mothers with a history of MMHD or with psychopharmacologic medication history **(Table 2)**
- Patients with a history of MMHD were 1.71 (95% CI: 1.58–1.85), times more likely to experience a stillbirth 1.81 (95% CI: 1.56–2.09) times more likely to deliver a newborn affected by abnormal fetal heart rate or rhythm, and 1.09 (95% CI: 1.01–1.1) times more likely to receive maternal care for fetal heart rate or rhythm abnormalities **(Figure 1)**
- Patients with a history of MMHD were 1.05 (95% CI: 0.98–1.12) more likely to receive maternal care for suspected fetal abnormality or damage and 0.76 (95% CI: 0.75–0.77) times less likely to have complications of labor and delivery **(Figure 1)**

FIGURE 1. Forest Plot outcomes of interest and odds ratios (ORs) with 95% CI

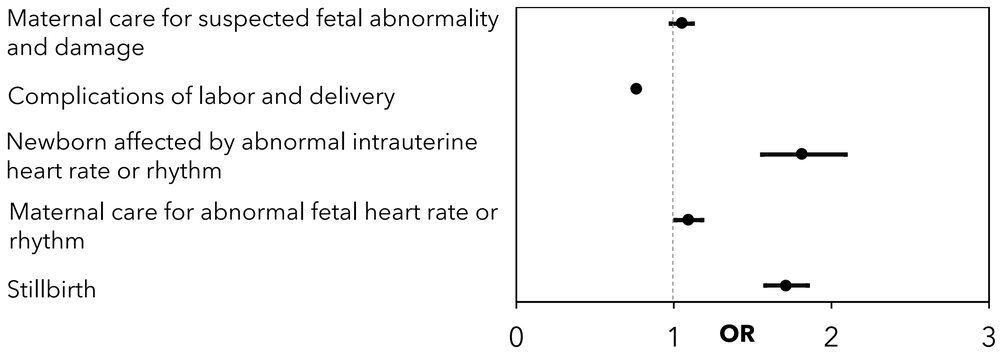

Table 2. Patient Characteristics

Characteristic	All births (N= 421,767)	MMHD (N=100,297)	No MMHD (N=321,470)
Age, years, mean	28.9	28.5	29.02
Ethnicity, n (%)			
Black	51,616 (12.2)	11,317 (11.3)	40,299 (12.5)
White	272,919 (64.7)	72,185 (72.0)	200,734 (62.4)
Other	73,370 (17.4)	10,562 (10.5)	62,808 (19.5)
Unspecified	23,862 (5.7)	6,233 (6.2)	17,629 (5.5)
BMI Category, n (%)			
Underweight	1,671 (0.4)	265 (0.3)	1,406 (0.4)
Normal	28,253 (6.7)	5,180 (5.2)	23,073 (7.2)
Overweight	100,467 (23.8)	19,006 (18.9)	81,461 (25.3)
Obese	278,970 (66.1)	74,642 (74.4)	204,328 (63.6)
Unspecified	12,406 (2.9)	1,204 (1.2)	11,202 (3.5)
Lifestyle Factors, n (%)			
Smoking	13,760 (3.3)	6,586 (6.6)	7,174 (2.2)
Alcohol Use	31,043 (7.4)	12,729 (12.7)	18,314 (5.7)
ACE Inhibitor Use	868 (0.2)	451 (0.4)	417 (0.1)
Diabetes Mellitus	16,455 (3.9)	6,576 (6.6)	9,879 (3.1)
Hypertension	35,592 (8.4)	15,813 (15.8)	19,779 (6.2)
Prenatal Vitamins	3,554 (0.8)	1,566 (1.6)	1,988 (0.6)

CONCLUSIONS

- This study suggests that maternal mental health disorders may increase the risk of fetal heart rate or rhythm abnormalities
- MMHDs were also associated with increased risks of adverse birth outcomes, including stillbirth and abnormal fetal heart rate or rhythm
- MMHDs were not significantly associated with complications of labor and delivery or maternal care for suspected fetal abnormality or damage
- Improving MMHD screening and treatment strategies during the prenatal period may reduce the scale of adverse intrauterine and birth outcomes

REFERENCES

(1) Centers for Disease Control and Prevention. Data and Statistics on Congenital Heart Defects. (2) Wu W, He J, Shao X. Incidence and mortality trend of congenital heart disease at the global, regional, and national level, 1990-2017. Medicine (Baltimore).