



Postpartum psychosis and SARS-CoV-2 infection: is there a correlation?

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Abstract

The COVID-19 pandemic has had a negative impact on mental health. Cases of psychosis associated with SARS-CoV-2 infection have been noted. The Women's Mental Health Program at the University of Arkansas for Medical Sciences determined four-fold increase from data from the last 5 years. We propose that the pandemic should be considered a risk factor for postpartum psychosis. Providers should emphasize sleep hygiene and monitor carefully for psychosis in postpartum women.

Keywords Postpartum psychosis · SARS-CoV-2 infection · COVID-19 pandemic

The coronavirus 2019 (COVID-19) pandemic has had a negative impact on the mental health of the population as a whole, healthcare workers, and those with preexisting mental health conditions (Vindegard and Benros 2020). A systematic review found that already-established risk factors for mental health conditions, including female sex, place individuals at higher risk for poor psychological outcomes in regard to the pandemic (Vindegard and Benros 2020). Consistent with data from previous pandemics, viral respiratory infections are associated with risk of new-onset psychosis (Menninger 1919, 1994), and authors have raised concern describing several cases of psychosis in individuals with SARS-CoV-2 infection (Watson et al. 2021).

Little is known at this time about the effect of the COVID-19 pandemic on mental health during pregnancy and the early postpartum period. Less still is known about the relationship between SARS-CoV-2 infection and postpartum psychosis; however, a possible relationship has begun to

emerge. Approximately four cases of postpartum psychosis in women infected with SARS-CoV-2 have been reported in the literature (Subramanyam et al. 2020, Franchi et al. 2020).

The Women's Mental Health Program (WMHP) at the University of Arkansas for Medical Sciences (UAMS) consists of inpatient and outpatient services focusing on the psychiatric care of pregnant and postpartum women. UAMS is the only academic medical center in the state and receives referrals from a broad catchment area. Due to a subjective notice by providers of a recent increase in evaluation and treatment of women with postpartum psychosis, objective data was analyzed to investigate trends in the diagnosis of postpartum psychosis during the COVID-19 pandemic. From March 2020 through February 2021, a total of nine women were diagnosed and treated for this condition. In the five preceding years, the WMHP diagnosed and treated an average of 2.2 women with postpartum psychosis each year (4 in 2015, 3 in 2016, 1 in 2017, 0 in 2018, and 3 in 2019). Among the women treated during the pandemic, three had confirmed SARS-CoV-2 infection closely preceding onset of psychotic symptoms and one received the vaccine against SARS-CoV-2 infection prior to symptom onset. We describe here in more detail these women with diagnosed postpartum psychosis following SARS-CoV-2 infection ($n=3$) and vaccination against SARS-CoV-2 ($n=1$), as well as the five who did not have, to our knowledge, preceding SARS-CoV-2 infection or vaccination. Women were identified by querying the electronic medical record for ICD-10 code of postpartum psychosis (F53.1). Identified charts were manually checked

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Table 1 Description of cases of postpartum psychosis from March 2020 to February 2021 at University of Arkansas for Medical Sciences Women's Mental Health Program

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Age	37	25	28	33	36	24	30	45	29
Education level	Doctorate	Bachelor's	Trade School	Bachelor's	Bachelor's	High School	Some College	Trade School	Bachelor's
Race*	White	White	Black	White	White	Black	White	White	White
Gravida (G)/Parity (P)	G2P2	G1P1	G5P4	G4P2	G2P2	G3P3	G3P1	G5P3	G1P1
Weeks of gestation at delivery	35w	39w1d	39w0d	39w	39w4d	37w6d	28w5d	38w4d	39w
Delivery method	C-section	Vaginal	C-section	C-section	Vaginal	C-section	C-section	Vaginal	C-section
Pregnancy Complications	Oligohydramnios	None	None	None	Gestational diabetes	No prenatal care	Preeclampsia	AMA	Preeclampsia, fetal distress
COVID-19 infection	Vaccine, postpartum	Yes, at delivery	Yes, second trimester	Yes, postpartum	No	No	No	No	No
Antenatal Comorbidities	Essential HTN	None	Asthma	Asthma	None	DM II, asthma	None	None	Essential HTN
Past psychiatric history	Postpartum depression	PTSD, suspected bipolar I disorder	PTSD	None	One previous episode of MDD	Postpartum psychosis	Depression unspecified	GAD	None
Family psychiatric history	Bipolar disorder (sister)	Bipolar disorder (mother, grandmother, and aunt)	Psychotic disorder (brother)	None	Anxiety (mom), depression (dad)	Unknown	Anxiety (sister)	None	None
History of substance use	None	None	None	None	None	Marijuana continued during pregnancy	None	None	None
Symptoms	No sleep for 6 days, disorganized thought processes, disorganized behavior, labile, attempted to elope from inpatient unit, pressured speech, irritable mood	No sleep for 1 week, starting projects, talking about suicide frequently, pressured speech, labile, impulsive, disorganized thought processes, attempted to elope from inpatient unit	Severe MDD with psychotic features, auditory hallucinations, paranoia, suicidal ideation, guilt, hopelessness, irritability	Decreased need for sleep, grandiose delusions, pressured speech, hyper-religious, excessive spending, hypersexuality, irritability	Paranoia, intrusive thoughts of harm coming to family, irrational fears that she would lose children, referential thinking	Paranoia, command auditory hallucinations to harm infant, disorganized behavior	Racing thoughts, insomnia, disorganized speech, delusions, paranoia, reported catatonia at outside hospital	Disorientation, disorganized thoughts, insomnia, perseveration, paranoia	Intrusive thoughts of daughter being sexually abused, visual hallucinations, catatonia, disorganized thoughts, not attending to ADLs, insomnia
Treatment	Inpatient hospitalization, lithium, lorazepam, olanzapine	Inpatient hospitalization, lithium, lorazepam	Fluoxetine, haloperidol	Inpatient hospitalization, lithium, lorazepam	Inpatient hospitalization, lithium, olanzapine, ECT	Inpatient hospitalization, lithium, risperidone	Inpatient hospitalization, lithium, quetiapine, lorazepam	Lithium, lorazepam	Inpatient hospitalization, lorazepam, olanzapine

* All women identified as non-Hispanic; AMA, advanced maternal age; DM II, type II diabetes mellitus; PTSD, post-traumatic stress disorder; MDD, major depressive disorder; GAD, generalized anxiety disorder; HTN, hypertension

to confirm diagnoses as well as to determine SARS-CoV-2 infection status. All women with primary psychotic disorder (i.e., schizophrenia or schizoaffective disorder) were excluded.

All nine women developed psychotic symptoms during the postpartum period. Postpartum psychosis was defined as new-onset psychotic symptoms following delivery up to 1 year postpartum, consistent with recent literature (Wesloot et al. 2016). One woman had a history of postpartum psychosis; otherwise, there was no history of psychotic symptoms among the subjects. Cases 2–4 had SARS-CoV-2 infection during the second trimester (case 3), at delivery (case 2), and within 1 week postpartum (case 4). All three of these women began exhibiting symptoms of psychosis within a month after delivery, and all had onset of psychotic symptoms after SARS-CoV-2 infection. Case 1 received the vaccination against SARS-CoV-2 infection 3 weeks postpartum and began exhibiting symptoms about 1-week post-inoculation. The symptom profiles we observed in all nine women were consistent with typical postpartum psychosis; common symptoms were decreased need for sleep, disorganized behavior, pressured speech, racing thoughts, disorientation, paranoia, and auditory hallucinations. None of the women had a medical or neurological explanation for development of symptoms. Seven of the nine women required inpatient psychiatric hospitalization for psychotic symptoms; two women were hospitalized at outside facilities and transitioned to the WMHP for outpatient care. All of the women are highly educated and had high premorbid levels of function. Table 1 further details the demographic information, presentation, and treatment of these nine women.

Postpartum psychosis affects between 0.89 and 2.6 of every 1000 postpartum women (VanderKruik et al. 2017). Although relatively uncommon, postpartum psychosis is a serious condition that can have significant impact on the health of both mom and baby (Jones et al. 2014). Known risk factors for postpartum psychosis include personal history of bipolar disorder, primiparity, preeclampsia, sleep disturbance, and immune dysregulation (Osborne 2018). The mechanism by which viral respiratory illness may precipitate psychosis is not well understood. Many of the women included here did have preexisting risk factors for development of postpartum psychosis; we cannot therefore assume that SARS-CoV-2 infection is solely responsible for development of their symptoms. However, this observed increase in cases is consistent with data from previous pandemics involving viral respiratory infections (Menninger 1918, 1919) and further exploration of this relationship may be warranted. Another prominent risk factor for mental health complications has been identified with the COVID-19 pandemic, though little data has been gathered at this time—the effect of social isolation in quarantine. A systematic review on the effects of quarantine has noted symptoms of

post-traumatic stress, fear, anxiety, anger, emotional exhaustion, low mood, and irritability (Brooks et al. 2020). Several studies included in this review note potential for these effects to be long-lasting. Among postpartum women, we theorize that the need to be isolated from family and friends to mitigate risk of COVID-19 exposure could exacerbate the already significant stressors of being a new mom and subsequently increase risk for the development of postpartum psychosis.

Emphasizing good sleep hygiene and ensuring mothers are getting adequate sleep is known to decrease risk of postpartum psychosis and is an important element of treatment when psychosis does occur (Bergink et al. 2015). The COVID-19 pandemic, with or without SARS-Cov-2 infection, appears to be a risk factor for development of postpartum psychosis. We encourage obstetrical providers as well as those caring for women and infants to help minimize this risk by discussing the importance of good sleep hygiene with their postpartum patients and their support systems as well as monitoring closely for sleep deprivation in these women. Further exploration into the correlation of the COVID-19 pandemic on psychotic symptoms may be useful in the etiology of postpartum psychosis as well as the prevention of this potentially devastating illness.

Data availability Not applicable.

Code availability Not applicable.

Declarations

Ethics approval This report was given designation as non-clinical human research by the University of Arkansas for Medical Sciences Institutional Review Board.

Consent to participate Not applicable.

Consent for publication Not applicable.

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