

COVID-19 in Pregnancy: Do Parturients Carry a High Risk of Adverse Maternal and Neonatal Outcomes?

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The research paper by Khan EA et al. in this issue of the *IJCCM* compares clinical features of pregnant women admitted to an intensive care unit (ICU) during the COVID-19 pandemic with a group of pregnant women admitted in the pre-COVID-19 period.¹ The management of high-risk pregnant women is an important challenge, especially within the context of high maternal and perinatal mortality rates in India. This study provides interesting insights into the comparative outcomes of pregnancy in women with and without COVID-19. The authors did a retrospective analysis of pregnant women admitted to the ICU from March 1, 2017 to March 1, 2020 (pre-Covid period) and from March 2, 2020 to March 2, 2023 (Covid period). They report that pregnant women were not at an increased risk for ICU admission due to SARS-CoV-2 and that there was no additional increase in morbidity or mortality observed in the pandemic era. The retrospective study design has limitations but is a pragmatic study design choice and provides insights for further prospective research.

Several studies reported an association of COVID-19 with increased ICU admission rates, maternal mortality, cesarean delivery, preterm births, hypertensive disorders of pregnancy (HDP) and perinatal mortality.²⁻⁶ However, these studies did not differentiate adverse outcomes attributable to the SARS-CoV-2 or other severe maternal comorbidity. The timing of the infection and the duration from acute infection to childbirth might impact the incidence of adverse pregnancy outcomes. Hughes BL et al.⁷ used a retrospective cohort design to compare 2,326 pregnant women with SARS-COV-2 with 11,705 pregnant controls. They reported an increased risk of adverse events in pregnant women with SARS-CoV-2 infection. Pregnant women identified with SARS-CoV-2 before the third trimester had an adjusted relative risk of 1.97 (95% CI: 1.01–3.85), 1.29 (95% CI: 1.02–1.63), and 1.74 (95% CI: 1.19–2.55) respectively, for perinatal mortality, preterm births, and hypertensive disorders in pregnancy. There were no significant differences in early preterm births, congenital malformations, estimated fetal weight <10th percentile, severe preeclampsia, or gestational hypertension.⁷

“Placentitis” has been reported in pregnant women with SARS-CoV-2. However, few prospective cohort studies have revealed the associations of placental histologic abnormalities with SARS-CoV-2.^{8,9} Hasbini YG et al.¹⁰ reported from their retrospective cohort study of 1,458 women that the risk of preeclampsia was higher even in asymptomatic pregnant women with SARS-CoV-2. The magnitude of preeclampsia was higher in symptomatic pregnant women (18.4%) and asymptomatic women (14.2%) compared with pregnant women (8.7%) without SARS-CoV-2. Preterm preeclampsia rates were higher in symptomatic women (11.8%) and asymptomatic

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women (5.2%) compared with pregnant women without SARS-CoV-2. They suggested that a racial or ethnic basis underlying the development of preterm preeclampsia might partly explain the differences in prematurity after SARS-CoV-2 infection in different populations. The rate of preterm preeclampsia was higher in the black population (10.1%) compared with other ethnicities or races (5.3%) in the SARS-Cov-2 infected pregnant women. However, the rate was almost similar (2.7%) for the black and non-black groups in the controls ($p = 0.05$).

The variant of SARS-COV-2 also impacts the distribution of clinical symptomatology and adverse pregnancy outcomes. Günther J et al.¹¹ reported that more people infected with the delta variant were symptomatic compared with the wild-type/alpha variant. The delta variant had an increased risk for dyspnea and the omicron variant had the lowest risk of dyspnea and loss of smell and taste. However, the omicron variant had a higher risk of nasal obstruction, cough with expectoration, headaches, muscle pains, and fatigue compared with the wild-type/alpha and delta variant. They reported neonatal outcomes worsened with the transition between variants from the wild-type/alpha to the delta variant and identified women with dyspnea and fever were more likely to have maternal ICU admission and preterm birth irrespective of vaccination status or gestational age at the onset of infection. sFlt-1/PIGF and maternal Lactate Dehydrogenase (LDH) have been identified as predictive parameters using machine learning¹² Arslan et al. reported that LDH values at admission predict severe infection in pregnant women with COVID-19.¹³ Favre et al. in a study of 2,055 pregnant women, reported increased risks of hospital and ICU admission, and advanced oxygen requirements during the delta

variant period.¹⁴ Gestational age, obesity, diabetes, and maternal age are other risk factors identified for ICU admission and maternal mortality.¹⁵

While several guidelines about the management of COVID-19 pregnant patients emerged during the pandemic,¹⁶ only a few studies compared the maternal and neonatal outcomes in pregnant COVID-19 patients. Further studies addressing the limitations of study designs, sequencing of variants, and long-term outcomes of pregnancy will help us better understand the progress and risk associated with SARS-CoV-2 in pregnancy.

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