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Original Research Article

Maternal and Perinatal Outcome among in SARS Cov-2 Infection

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Abstract

Introduction: This study aimed to investigate the maternal and perinatal outcomes associated with SARS-CoV-2 infection in pregnant women. Previous research indicates increased risks of maternal death, pre-eclampsia, thromboembolic disease, and preterm birth, with a low likelihood of vertical transmission. Understanding these impacts is crucial for optimizing pregnancy care.

Methods: This ambidirectional study, conducted at GSL Medical College, assessed maternal and neonatal outcomes in SARS-CoV-2 positive pregnant women between June 2020 and October 2021. Data on delivery mode, maternal outcomes, neonatal birth weight, APGAR scores, and COVID-19 symptoms were collected. Statistical analysis used SPSS version 20.0 with significance set at $P<0.05$.

Results: Total 172 pregnant women were included. Majority (82.6%) belong to 21 – 30 years, 66.8% (115) pregnant women were multigravidae. The mean gestational age (GA) was 31.19 ± 8.61 weeks, ranged between 14 and 42 weeks. COVID-19 was detected in 3 new born. Statistically there was no significant difference between severity of infection and mode of delivery, birth weight, NICU admission respectively.

Conclusion: The study found no significant differences in neonatal COVID-19 severity, delivery mode, birth weight, or NICU admissions, suggesting maternal SARS-CoV-2 infection does not significantly impact these outcomes. The low incidence of vertical transmission and mild neonatal COVID-19 indicate a relatively low risk to newborns, emphasizing the need for continued research.

Keywords: Maternal SARS-CoV-2 infection, Neonatal outcomes, Vertical transmission, Birth weight, NICU admissions.

Introduction

The emergence of SARS-CoV-2, the virus responsible for COVID-19, has presented significant challenges for healthcare professionals worldwide. Pregnant women are a population of particular concern, as pregnancy can alter immune function and potentially increase susceptibility to infections. [1] Understanding the impact of SARS-CoV-2 infection on both mothers and their newborns is crucial for optimizing care during pregnancy.

Several studies have investigated the maternal and perinatal outcomes associated with COVID-19. A meta-analysis by Zhu et al. [2] revealed an increased risk of maternal death (relative risk [RR] 7.68, 95% confidence interval [CI] 1.70 to 34.61) in pregnant women with SARS-CoV-2 infection compared to uninfected women. [3]. Furthermore, studies by Desai et al. (2022) and Gupta et al. (2022) demonstrated a higher risk of pre-eclampsia, a pregnancy complication characterized by high blood pressure and protein in the urine, and thromboembolic disease (blood clots) in COVID-positive mothers. [2,3].

Preterm birth, defined as delivery before 37 weeks of gestation, is another potential complication. Poon et al. [4] reported an association between symptomatic maternal COVID-19 infection and a higher incidence of preterm delivery, particularly among women with severe illness. However, the risk of vertical transmission, where the virus passes from mother to baby during pregnancy or childbirth, appears to be low based on studies by

Desai et al. [3] and Poon et al. [4] This study aimed to investigate the maternal and perinatal outcomes associated with SARS-CoV-2 infection in pregnant women.

Methods

It was an Ambi directional research conducted in the department of OBG, GSL Medical College, Rajahmundry. Study was conducted between June 2020 to October 2021. Study protocol was approved by the Institutional Ethics Committee. The antenatal women aged >18 years, SARS CoV 2 positive were included in the study. Non cooperative women were not considered in the research.

Study was clearly explained to all the participants. The women were asked to wear N95 mask during the delivery. The antenatal check-up was carried as per the institutional protocol. The mode of delivery was assessed and the outcome of the mother was analysed.

The neonatal birth weight and APGAR score was calculated at 1 and 5 minutes. Simultaneously, symptoms such as fever, lethargy, respiratory symptoms, and intolerance to feeds were assed and recorded. Immediately after birth, the neonate was separated from the mother CoVID 19 infection was detected as per the protocol.

Statistical Analysis: Statistical analysis was carried by using SPSS software version 20.0. Descriptive data was presented mean $\pm$ standard deviation (SD) and percentages. Chi square test was done to assess the association of various categorical variables. $P<0.05$ was considered as statistically significant.

Results

In this study, total 172 pregnant women were included. Majority (142; 82.6%) belong to 21 – 30 years. In current study, 66.8% (115) pregnant women were multigravidae. The mean gestational age (GA) was 31.19 ± 8.61 weeks, ranged between 14 and 42 weeks. Majority (64; 46.4%) had fever followed by cough (52; 37.7%), breathlessness (8; 5.8%). Around 138 (80.2%) reported no CoVID contact history. Majority (66.9%; 115) stayed 5 to 10 days in the hospital, followed by <5 days (28.5%; 49), mean duration was 6.05 ± 2.35 days. The normal vaginal delivery (NVD) was the common (101; 59.4%). The mean APGAR score of new born was 8.75 ± 0.81. NICU admission was required for 13.9% (23). Most of the NICU admission was due to low birth weight (8) and meconium aspiration syndrome (8). CoVID 19 was detected in 3 new born. Statistically there was no significant difference between severity of infection and mode of delivery, birth weight, NICU admission respectively.

Discussion

In this study, a total of 172 pregnant women were included, with the majority (82.6%) aged between 21 and 30 years. This demographic reflects the typical reproductive age group, which aligns with findings from other studies indicating that most pregnant women with SARS-CoV-2 infection fall within this age range. A significant proportion of the participants (66.8%) were multigravidae, indicating that they had been pregnant more than once. This high percentage of multigravidae aligns with existing literature, which suggests that previous pregnancy experience may influence maternal outcomes and pregnancy management strategies.

The mean GA of the participants was 31.19 ± 8.61 weeks, with a range between 14 and 42 weeks. This wide range highlights the potential for SARS-CoV-2 infection to impact pregnancies at various stages, from the second trimester to full term. [5] Studies have shown that the timing of infection during pregnancy can significantly influence both maternal and neonatal outcomes. [6] For instance, infections in the third trimester are often associated with higher rates of preterm delivery and neonatal complications.

Moreover, the mean GA in this study suggests that many women were in the later stages of pregnancy when infected. This is crucial as third-trimester infections have been linked to a higher risk of adverse outcomes such as preeclampsia and preterm labor. Effective management of these pregnancies requires careful monitoring and tailored clinical care to mitigate risks to both the mother and the fetus. The findings from this study underscore the importance of continuous surveillance and appropriate healthcare interventions for pregnant women during the COVID-19 pandemic. [7]

The detection of COVID-19 in three newborns within this study underscores the potential for vertical transmission of the SARS-CoV-2 virus, although the frequency of such transmission remains relatively low. The current evidence regarding the impact of maternal COVID-19 infection on neonatal outcomes presents a complex and evolving picture. In this study, statistical analysis revealed no significant differences in the severity of infection, mode of delivery, birth weight, and NICU admission rates among newborns, suggesting that these factors may not independently influence neonatal COVID-19 outcomes.

Vertical transmission of SARS-CoV-2, while possible, appears to be rare. Several studies have investigated the presence of the virus in amniotic fluid, placental tissue, and breast milk, with mixed results. For instance, a systematic review by

Walker et al. [8] indicated that the incidence of vertical transmission is low, with most neonates testing negative for the virus even when born to COVID-19-positive mothers. This aligns with the findings of this study, where only three newborns were detected with COVID-19, indicating a low rate of transmission.

The mode of delivery has been a point of concern, with some early reports suggesting that cesarean delivery might reduce the risk of neonatal infection. However, subsequent studies have shown no significant difference in infection rates between vaginal deliveries and cesarean sections. A large cohort study by Knight et al. [5] found that the mode of delivery did not significantly affect the likelihood of neonatal infection. This study's findings are consistent with that evidence, indicating no statistical difference in infection severity based on delivery mode.

Birth weight is another critical factor in neonatal health, and low birth weight is often associated with adverse outcomes. However, the relationship between maternal COVID-19 and neonatal birth weight remains unclear. A study by Villar et al. [9] observed no significant differences in birth weights of infants born to COVID-19-positive and negative mothers. The current study similarly found no significant impact of maternal COVID-19 on neonatal birth weight, suggesting that SARS-CoV-2 infection does not directly affect fetal growth parameters.

NICU admissions are typically a marker of neonatal distress or prematurity, and early concerns suggested that COVID-19-positive mothers might have higher rates of preterm births and NICU admissions. However, data have been inconsistent. A meta-analysis by Allotey et al. [6] reported slightly increased NICU admissions for infants born to infected mothers, but the reasons were often unrelated to COVID-19. In the present study, NICU admission rates did not significantly differ, indicating that maternal infection status alone may not be a decisive factor for NICU necessity.

Moreover, the severity of neonatal COVID-19 infection is generally mild, with most newborns experiencing asymptomatic or mild disease. Dong et al. reported that the majority of neonates with COVID-19 have favorable outcomes, with severe cases being extremely rare. [10, 11] This aligns with the observations in this study, where no significant severity differences were found, supporting the notion that neonatal outcomes are generally positive, irrespective of maternal infection.

The findings of this study contribute to the growing body of evidence that suggests maternal COVID-19 infection may not significantly alter key neonatal outcomes such as birth weight, mode of delivery, and NICU admissions. While the detection of COVID-19 in newborns remains a concern, the overall risk appears to be low, and the severity of neonatal infection is typically mild. [12] These insights are crucial for guiding clinical practices and reassuring expectant mothers during the ongoing pandemic. Continued research and large-scale studies are essential to further elucidate the nuanced impacts of maternal SARS-CoV-2 infection on neonatal health.

The study found no significant differences in neonatal COVID-19 infection severity, mode of delivery, birth weight, or NICU admissions. These findings suggest that maternal SARS-CoV-2 infection does not significantly impact these key neonatal outcomes. The low incidence of vertical transmission and generally mild nature of neonatal COVID-19 reinforce the notion that while vigilance is necessary, the overall risk to newborns is relatively low. Continued research is essential to provide more comprehensive insights and guide clinical practices to ensure optimal maternal and neonatal health during the COVID-19 pandemic.

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