

Outcomes of Neonates born to Covid Positive Mothers: An Observational Study

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Abstract: ***Objectives:** To analyse the data of outcomes in new born babies born to Covid positive mothers. To help study outcomes in new - borns affected with Covid - 19 which could enable us to formulate better management options to improve outcomes. To prevent resurgence of another global pandemic by analyzing one of the vulnerable populations. **Methods:** From the available data from hospital records the data of neonates born to Covid positive mothers between 1/03/2020 and 30/06/2021 was collected and analyzed. **Results:** Out of 93 neonates studied, 76 were of term gestation and 17 were of Pre - term gestation. RTPCR was done for 51 neonates out of which only 4 were found to be Covid Positive. Out of these 3 belonged to the term gestation and 1 belonged to pre term gestation category. In the given study, out of the 93 neonates born to covid positive mothers, RTPCR test was done for 51 neonates. Only 4 neonates were found to be Covid positive out of which 3 belonged to the Term gestation category and 1 belonged to the Pre - Term gestation category. It was observed that the neonates born at term showed average gestational age and suffered from neonatal hyperbilirubinemia. 1 Covid positive neonate born at pre term gestation, although showed average gestational age but had low birth weight of 1520 grams. This neonate was DCDA twin 2 and also showed signs of respiratory distress and neonatal hyperbilirubinemia. **Conclusion:** In the current study, the possibility of vertical transmission can be debated because RTPCR was reported positive in 4 neonates who were either separated from mother at birth and nursed in NICU or were tested within 24 hours of birth. Possibility of horizontal transmission from asymptomatic NICU staff to neonates cannot be excluded completely.*

Keywords: Neonate, Covid 19, Pregnant women, RTPCR, vertical transmission, horizontal transmission, outcomes

Highlights

- 1) The clinical status like Survival, health status of the neonate along with presence of any complications characteristics of new - borns born to women infected with COVID - 19.
- 2) Study outcomes in new - borns affected with Covid - 19 could enable us to formulate better management options to improve outcomes
- 3) To prevent resurgence of another global pandemic by analyzing one of the vulnerable populations.

1. Introduction

Covid - 19 (Corona Virus Disease - 2019) is an infectious disease caused by SARS - CoV2 (Severe Acute Respiratory Syndrome Corona Virus 2). This strain of viruses is known to cause severe acute respiratory syndrome. The novel severe acute respiratory syndrome coronavirus 2 (SARS - CoV - 2) is a highly transmittable virus and it increases the risk of complications among the infected population. The first ever case of Covid - 19 was identified in December 2019 in the Hubei province of Wuhan, China¹. From there on it spread to all parts of the world. The World Health Organization (WHO) declared the spread of this disease as a Public Health Emergency of International concern and then later on as a pandemic in January and March, 2020 respectively^{2,3,4}. There are certain population groups that are more vulnerable to severe effects of COVID - 19 e. g. - older adults, people with certain medical conditions like chronic kidney disease, diabetes mellitus, chronic lung diseases, cystic fibrosis etc.⁵ Although much has been written about

the course of COVID - 19 in adults, much data is not available for pregnant women and their new - borns. For several other viral infections, pregnancy confers increased risk of morbidity, and a high risk of vertical transmission and adverse outcomes in new - borns.^{6,7,8,9,10}. Available data suggests that, in general, the outcome among pregnant women and neonates is good. A large proportion of infected pregnant women are likely to be asymptomatic or have mild symptoms¹¹. The present study was undertaken to analyse the data of outcomes in new born babies born to Covid positive mothers.

2. Methods

Inclusion Criteria:

Neonates born to COVID positive mothers between 1/03/2020 and 30/06/2021

Biological materials required (type - blood, tissue etc and quantity): NIL

Statistical methods: Descriptive statistics based on outcome of neonates born pre - term and term gestation

Tools used: NIL

Detailed description of procedure / processes:

The analysis of the Medical Records of the Neonates born to mothers positive with suspected SARS - CoV - 2 infection at the Kasturba Hospital, Manipal between 1/03/2020 and

30/06/2021 was conducted and details about the neonates which are born to mothers with COVID - 19 infection during delivery, was collected. This multispecialty hospital is located near Udupi, a sub - urban town in the state of Karnataka, India. Neonates were categorized into Preterm and Term as per their gestational age. Then, they were followed - up through available information in the Medical Records for complications related to prematurity, presence of infection, unexplained respiratory distress. The Unit protocol was to do RT - PCR at the time of discharge or day 5. If information was available, data was collected and analyzed, the objective being to provide documented information on infant outcomes.

We aimed to evaluate the clinical characteristics of new - borns born to women infected with COVID - 19.

Outcome measures: The outcomes measured were survival, health status of the neonate along with presence of any complications. The neonatal outcomes of interest were birth weight, fever, respiratory distress, appropriate/small/large for gestational age, complications like sepsis, hypoglycaemia etc, RT PCR results of the neonate for COVID - 19.

Potential risks and benefits:

Risks –less than minimal

Ethical considerations and methods to address issues: IEC clearance was granted under the reference number, IEC 527/2021. Additionally, permission was taken from Medical Super intendent to access medical records from Kasturba Hospital, Manipal, Karnataka. Furthermore, indirect identifiers were used to ensure confidentiality.

Budget and proposed funding source: NIL

3. Results and Outcome

Outcomes of 93 infants who were each born to SARS - Cov - 2 infected mothers was analyzed during the course of this study. Out of 93 neonates studied, 51 were male and 42 were female. (Table 1).

Neonates were categorized into Preterm (<37 weeks) and Term (>37 weeks) as per their gestational age. Out of the 93 neonates studied, 76 were of Term gestation and 17 were of Pre - term gestation. (Table 2)

In case of Pre - term gestation category, 4 of the neonates suffered complications and did not survive. The rest of the 13 neonates developed post - delivery complications and required additional interventions. Of these 13 neonates, 9 required non - invasive intervention while 4 required invasive intervention.

In the case of 76 neonates belonging to Term gestation category, none were deceased. 31 neonates developed post - delivery complication - neonatal hyperbilirubinemia. In case of 29 neonates, non - invasive intervention was required while the remaining two required invasive intervention. Of these two neonates, one developed Meconium Aspiration

Syndrome with Persistent Pulmonary Hypertension of Newborn and the second neonate developed respiratory distress syndrome.

In the given study, out of the 93 neonates born to covid positive mothers, RTPCR test was done for 51 neonates. Only 4 neonates were found to be Covid positive out of which 3 belonged to the Term gestation category and 1 belonged to the Pre - Term gestation category. It was observed that the neonates born at term showed average gestational age and suffered from neonatal hyperbilirubinemia. 1 Covid positive neonate born at pre term gestation, although showed average gestational age but had low birth weight of 1520 grams. This neonate was DCDA twin 2 and also showed signs of respiratory distress and neonatal hyperbilirubinemia.

Table 1: Demographic details of the studied population

		No. of Neonates
Gender of the Neonates	Male	51
	Female	42
Gestational age of the Neonates	Term (>37 weeks)	76
	Preterm (<37 weeks)	17

4. Discussion

Our study shows low rates of testing - based COVID positivity in neonates born to COVID positive mother. SARS - CoV - 2 positive neonates were five times more likely to be asymptomatic and twice more likely to need resuscitation. They had significantly higher probability of having sepsis and septic shock. SARS - CoV - 2 positive neonates were also more likely to have abnormal radiological findings and require respiratory support. They were also more likely to have received surfactant, steroids and/or inotropes. Neonates are precarious as they are at risk of transmission of COVID 19 infection (i) in utero through the placenta, (ii) in the immediate peripartum period through amniotic fluid aspiration and fetoplacental bleed and lastly, (iii) through breastfeeding. Hence, once a neonate is born to COVID 19 positive mother, all possible routes of transmission should be taken into consideration¹². Recent evidence suggests vertical transmission of COVID 19, as reported by Vivanti et al.¹³ The case report described signs of acute and chronic intervillous inflammation consistent with the severe systemic maternal inflammatory status triggered by SARS CoV 2 and demonstration of virus in neonatal samples associated with neurological symptoms thus implying transplacental transmission of SARS CoV 2. Another case report has also raised the concern of positive amniotic fluid for COVID 19 and positive antibody titres in neonates immediately at birth¹⁴. Similar case of positive amniotic fluid followed by pneumonia in the neonate is also observed by Zheng et al.¹⁵. Few earlier reports, however, failed to demonstrate the vertical transmission from mother to neonate by placental and fetal tissue examination^{16, 17, 18}. A study also reported that COVID - 19 - positive pregnant women present with fewer symptoms than the general population and may be RT - PCR negative despite having signs of viral pneumonia. The incidence of preterm births, low birth weight, C - section, NICU admission appear higher than the general population^{19, 20}.

In the current study, the possibility of vertical transmission can be debated because RTPCR was reported positive in 4 neonates who were either separated from mother at birth and nursed in NICU or were tested within 24 h of birth

Possibility of horizontal transmission from asymptomatic NICU staff to neonates cannot be excluded completely. Moreover, in the hospital, strict adherence to PPE and precautions during procedures was followed, to minimise the probability of transmission by health care providers.

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Conflict of Interest

No Conflict of interest declared by the authors.

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