International Journal of Contemporary Pediatrics
*Pathak S et al. Int J Contemp Pediatr. 2021 Jan;8(1):134-137*
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20205519

**Original Research Article**

# Short term outcome of neonates born to mothers with SARS-CoV2 infection

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**Received:** 02 November 2020
**Accepted:** 11 December 2020

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## ABSTRACT

**Background:** Objectives of the study was to assess the clinical presentation and risk of mother-to-infant transmission of SARS-CoV2 in infants born to mothers with COVID-19 infection.
**Methods:** This was a prospective observational study. This study was conducted in tertiary care centre and a dedicated covid hospital in central India. Infants born to mothers diagnosed to have COVID-19 at the time of delivery, born between 1 June and 25 September 2020 will be included in the study.
**Results:** Total 60 infants were born to mothers with COVID-19 at the time of delivery. Three neonates tested positive for SARS-CoV2 after birth-one had mild respiratory symptoms and the other two infants remained well. A preterm baby who was negative for covid died due to extreme prematurity with sepsis (early onset) with respiratory failure on day 4 of life and another baby who was negative died due to hypoxic ischaemic encephalopathy stage 3 with Meconium aspiration syndrome with respiratory failure. Remaining 58 neonates and their mother roomed in while in hospital and all were breast fed. None of the other neonates developed any significant health issues or developed symptoms attributable to SARS CoV2.
**Conclusions:** The risk of mother-to-infant transmission of SARS-CoV2, in the perinatal period is very low. Breast feeding and rooming in can be practiced safely with adequate infection control precautions with negligible clinical risk to the infant.

**Keywords:** Breastfeeding, COVID-19, Newborn

## INTRODUCTION

The novel SARS-CoV2 which leads to the clinical syndrome now labelled as COVID-19 was first detected in the Wuhan–Hubei province of China in December 2019. Since then, it has spread across the world with the WHO declaring it as a global pandemic on 11 March 2020.[1] Knowledge about the epidemiology and clinical presentation of COVID-19 is rapidly evolving. Although the virus affects individuals across the age spectrum, it is becoming increasingly apparent that outcomes in adults are worse than in children.[2,3] The vast majority of subjects infected display only mild symptoms or remain asymptomatic.[4] Women are deemed to be in an immunocompromised state and data from previous corona virus epidemics (SARS-CoV and MERS-CoV) have shown that they were at a high risk of morbidity and mortality.[5] The literature published so far on COVID-19, however, suggests that hospitalized pregnant women do not seem to be at a higher risk of adverse outcomes compared with hospitalized non-pregnant individuals.[6,7] The risk of vertical transmission to infants born to mothers with COVID-19 seems low.[7-11] In the few infants who tested positive following birth, it was not certain whether the transmission was vertical or postnatal and further, the majority of these infants had only mild-to-moderate disease.

Here, we present the short-term outcomes of infants born to mothers infected with SARS-CoV2 and the safety of a policy of rooming in and breast feeding such babies at our hospital.

## METHODS

All Neonates born to mothers who tested positive for SARS-CoV2 during pregnancy from 1 June to 20 September 2020 were eligible to be included in the study. SARS-CoV2 virus was diagnosed by real-time reverse-transcriptase PCR in nasopharyngeal swab taken up by an expert on day 2 of life or at admission for neonates referred from other centers as covid suspect .Interpretation of the result was performed according to the manufacturer's recommendation. Once a negative result was obtained, babies were labelled as covid negative and test were not repeated for asymptomatic neonates as per the institutional protocols. Neonates who were well enough to be cared on the postnatal ward were allowed to room in with their mothers except where mother or child were too critical and required admission in intensive care unit. Neonates who roomed in were allowed to breast feed with adequate droplet and contact precautions in accordance with recommendations from professional bodies. This included caring for the infant in a separate baby cot which is placed at least 6 feet from the mother's bed, mother wearing a mask when in close proximity to the infant and performing hand hygiene with either soap and water or alcohol based gel prior to handling the baby. No visitors apart from health personnel with appropriate personal protective equipment were permitted in to the rooms while in hospital. The parents were advised to continue the same precautions at home after discharge till the mother was considered negative for COVID-19 and had been in isolation for 14 days.

### *Data collection and analyses*

The Baseline characteristics(age at admission, sex, birth weight, gestational age), clinical details which included term/preterm, clinical diagnosis (transient tachypnoea of neoborn, hypoxic ischemic encephalopathy stage 3, meconium aspiration syndrome, hypoglycaemia, sepsis (early onset), roomed in with mother in hospital, breast fed at the time of discharge and results of COVID-19 screening were collected from the patient record. Informed consent was obtained from the parents for inclusion in the study. Data were collected on an electronic database and analyzed.

## RESULTS

A total of 40 neonates born to covid positive mothers were included in the study period of 1$^{st}$ June to 25$^{th}$ September. The baseline characteristics are summarized in Table 1.

Out of the 60 neonates as summarized in Table 2, 7 were admitted to intensive care unit-most of these 5(8.3%) for transient tachypnoea and/or prematurity (2.5%).There were 2(3.3%) deaths out of total 60 neonates born to covid positive mother till 30$^{th}$ of October both were negative for covid (A preterm baby died due to extreme prematurity with sepsis (early onset) with respiratory failure on day 4 of life and another baby died due to hypoxic ischaemic encephalopathy stage 3 with Meconium aspiration syndrome with respiratory failure). 58 of the 60 neonates (96%) received breast milk either directly if rooming in with mother or via expressed breast milk if admitted to NICU. At the time of writing the report, the discharge outcomes of 56 neonates were known while 2 neonates are still in the hospital.

Three Neonates tested positive (Table 3) for SARS-CoV2, out of these 3 the first one who was born via LSCS admitted for mid cough and fever on day 20 of life and a history of contact with covid positive mother after almost 15 days of her delivery came positive for covid 19, received supportive treatment and discharged successfully on day 10 of isolation in stable condition, and other two came positive for coivd 19 on day 3 and day 10 of life both were asymptomatic discharged successfully after 10 days of isolation.

## DISCUSSION

Despite initial concern that pregnant women and the newborn may be high-risk groups compared with the general population based on outbreaks of other coronavirus diseases in the past, it has become increasingly clear that this is not the case with the SARS-CoV2 pandemic.[6-11] The risk of vertical transmission of the virus from mother to infant before or during delivery has been shown to be low.[7–11] This has been confirmed based on virus testing and clinical features in our cohort, with the estimated risk being only 7.5%(3/35). This figure seems to be similar to previously published data.[6,9] The low risk of vertical transmission has been hypothesised to be due to paucity of ACE2 receptors in the placenta which may be necessary for transplacental transfer to the fetus.[9] Regardless of the above, it would appear from our series that the short-term clinical risks to the infant from maternal COVID-19 at the time of delivery are minimal. Due to the uncertainty surrounding the outcomes of mothers affected by COVID-19 and their infants, recommendations on the postnatal management of the mother–infant dyad from professional bodies have been inconsistent.[12-16] Some guidelines advocate caring for the affected mothers and their infants in separate rooms when feasible to reduce the risk of mother–infant transmission postnatally and also recommend avoiding direct breast feeding while mother is still infected, unless mother expresses her wish to directly breast feed.[16,17] At our hospital, we found that the benefits of both rooming in and breast feeding with good infection control precautions, for mother–infant bonding and long-term breastfeeding far outweighed the small risk of mother–

infant transmission. Thus, we strongly recommended rooming in and direct breast feeding for all well mother–infant dyads while in hospital as well as after discharge. Our study has validated this approach with no clinically or laboratory-proven mother to infant transmission of the virus during the hospital stay, even with a very high rate of breast feeding in the discharged infants.

To our knowledge, this study is the single largest series on the outcomes of infants born to mothers with COVID-19 with follow-up of their health status post discharge. However, our study has limitations. The diagnosis of COVID-19 and virus carriage was based on NP swabs. Though the absolute sensitivity of detecting SARS-CoV2 with NP swabs is unknown, the modality is only around 70% sensitive for diagnosing respiratory viral infections.[18] The universally good clinical outcomes in all the infants are nevertheless encouraging. The follow-up of infants was conducted by telephonic interview of the parents. There is a chance that asymptomatic and mildly symptomatic infants infected with the virus may have been missed in the absence of testing, although we would suggest that this is of limited clinical significance.

## CONCLUSION

The risk of mother-to-infant transmission of SARS-CoV2, in the perinatal period is very low. Breast feeding and rooming in can be practiced safely with adequate infection control precautions. The risk of adverse outcome to infants born to mothers who have SARS-CoV2 infection at birth is minimal aside from the risk of premature delivery due to iatrogenic/ maternal causes. However, there are no published long-term outcome data on these infants and further follow-up studies will be needed to fully ascertain adverse outcomes in this group of infants.

## ACKNOWLEDGEMENTS

Authors would like to thank Head of the Department Dr Avyact Agrawal, Dr Pawan for their guidance. Our colleagues Dr Pratibha Bamne, Dr Ravi Uikey, Dr Akhilendra Parihar, Senior Residents and Postgraduate residents for their constant efforts in the management of covid children. Authors would also like to thank to Dr Shashank Pandey for contribution in literature search.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Pathak S, Lazarus M, Tiwari A. Short term outcome of neonates born to mothers with SARS-CoV2 infection. Int J Contemp Pediatr 2021;8:134-7.