



STUDY OF ADVERSE NEONATAL OUTCOMES BORN TO SARS-CoV-2 POSITIVE MOTHERS.

Paediatrics

**Dr. Kalmani
Rasika S**

Post Graduate, Department of Pediatrics KVG Medical College and Hospital, Karnataka.

Dr. Shyam Sundar

Associate professor, Department of Pediatrics KVG Medical College and Hospital, Karnataka.

ABSTRACT

Retrospective review of hospital records of 42 mother baby dyads at or above 34 completed weeks of gestation and tested SARS-CoV-2 positive by antigen or RTPCR within 14 days preceding delivery from 1st August 2020 till 6th February 2022 and the nasopharyngeal RTPCR reports of 43 neonates born to such mothers within 24- 48 hours were reviewed. Demographic and clinical features of neonates were studied. Of the 42 mother-baby dyad and 43 newborns (1 DCDA) one newborn tested positive (2.32%). No maternal ICU or maternal mortality was observed. Thirty newborns (69.76%) were delivered via cesarean of which 3 (6.97%) were late-preterm while 3 (6.97%) were post dated deliveries. No gender discordance and meconium stained liquor noted in 4 deliveries (9.30%). 7 were SGA (16.27%) while rest were AGA. 2 babies (4.65%) required resuscitation at birth and 3 (6.97%) required NICU admission (Respiratory distress was the most common cause) with 2 (4.64%) having mild requiring oxygen while 1 (2.32%) had severe distress requiring invasive ventilation. 38 (88.37%) were asymptomatic while 5 (11.62%) had adverse outcomes in the form of TTNB (4.65%), fever (2.32%), probable sepsis (2.32%), stillbirth (2.32%), PPHN (2.32%), poor feeding and lethargy (2.32%). 1 (2.32%) neonate succumbed to PPHN on day 2. TTNB (4.65%) was the most common postnatal adverse outcome. Neonates have an overall favorable prognosis. We propose that a professional should always be present at the time of delivery for the possible need of resuscitation considering the higher incidence of respiratory distress 6.97% and birth asphyxia 2.32% in our study.

KEYWORDS

SARS-CoV-2 mother, neonate, outcome.

INTRODUCTION:

Coronavirus disease 2019 (COVID-19) is a highly infectious disease that was declared pandemic by the World health organisation (WHO) on March 11, 2021. Placental cells coexpressing ACE2 and TMPRSS2 proteins, required for SARS-CoV-2 viral cell entry, are rare hence the rate of maternal to fetus transmission is low. (1-5)

There are limited studies from South India explaining the possibility of transmission of SARS-CoV-2 from the infected mother to the neonate and its outcomes. With SARS-CoV-2 cases again on the rise; knowledge of covid positivity rate and early postnatal outcomes in the past two years will assist in counselling and tailoring preparations of facility based newborn care of covid positive deliveries in rural areas of developing countries for the upcoming pandemics.

METHODS AND STATISTICS:

After obtaining institutional ethical clearance, the labour ward register of the institute from 1st August 2020 till 6th February 2022 were reviewed for delivery records of 42 mother-baby dyads and 43 newborns (1 DCDA pregnancy) above 34 weeks of gestation and were diagnosed with COVID-19 by antigen/RTPCR within 14 days preceding delivery. During the study period, following delivery, all the healthy babies (normal APGAR scores and no signs of respiratory distress) were roomed in with mother and initiated breast feeding. All parents were advised for testing of the newborns for SARS-CoV-2 by nasopharyngeal RTPCR within 24-48 hours of birth in consenting parents. The data was entered and analysed using Microsoft Excel. Parents who refused testing of their newborns and neonates with tracheo-esophageal fistula, diaphragmatic hernia, other gross congenital anomalies which can cause birth asphyxia or respiratory distress were excluded.

RESULTS:

Out of the total 43 newborns, 41 were tested and one (2.32%) tested positive for SARS-CoV-2. The clinical profile of all the neonates have been summarized in table. The positive neonate was healthy, exclusively breastfeeding and did not require re-hospitalization till date (18 months of life) as was enquired on telephonic conversation. TTNB was (4.65%) was the most common adverse outcome inline with other studies (6,7). Preterm birth, as the most common adverse pregnancy outcome in mother's with SARS-CoV-28 could not be ruled out: as our study sample was inclusive of only late-preterm and term deliveries.

DISCUSSION:

Maternal and neonatal characteristics: No maternal ICU or maternal mortality was observed. 3 (6.97%) were late-preterm while 3 (6.97%) were postdated deliveries.

Yan et al, Wróblewska-Seniuk K et al reported no vertical transmissions; however, these study included clinically diagnosed COVID-19 mothers or babies separated from mothers after birth (3,9). In this study other than the 13 neonates (61.9%) who required NICU admission all others were roomed in with mothers in postnatal wards (10).

Amongst Indian studies variability in the incidence of newborn covid positivity has been observed. West bengal study found 14.9% newborns were positive (21). While Mumbai study found 6.48% (14). In our study one of the 43 newborns (2.3%) was positive at 48 hours which is inline (3.2-3.9%) to various metanalysis studies (7,15). Male and female newborns were found to be almost equally affected in our study which is incoherent with other authors who found male (6) preponderance 60.4% and a 2:1 male:female dominance (14,16).

The WHO threshold for cesarean section birth is 15% (17). However during COVID higher rates 83.17% (6), 83.3% (14), 92% (18) were detected across studies. It was established by NNF that mode of delivery does not impact transmission of the infection to the baby (19) still, the cesarean section rates have been found to be higher among SARS-CoV-2 infected mothers, and in our study too it was 69.76%.

The liquor was meconium - stained in 9.30% of all deliveries which is similar 10% to the pre-COVID era (20) as was observed in other similar (6) studies 7.92%.

Of all the newborns 7 were SGA (16.27%) while rest were AGA which is lesser (25%) (21), (33.3%) (10) as compared to other studies.

Neonatal morbidity/mortality: 38 (88.37%) newborns were asymptomatic while 5 (11.62%) had adverse outcomes which is lower 25.9% than observed by Dinesh Munian et al (21). We found mild and self-limiting symptoms in our study with 1 neonate (2.32%) having fever. None of the newborns in the study sample had culture proven sepsis (8,10) however poor feeding/lethargy was seen in 2.32% as against 7.87% (21). 1 stillbirth was born to asymptomatic primi, 34 week 6 days SARS positive mother. Due to non availability of consent; RT-PCR swab or blood investigations couldn't be taken of the fetus. Stillbirth attributable to SARS-CoV-2 couldn't be ruled out.

One term male SGA neonate born by cesarean delivery to a G2P1L1 mother had low APGAR, no spontaneous respiratory effort, Downe-Anderson's score-6/10 requiring intubation at birth was referred to higher centre and eventually succumbed to PPHN. Due to non availability of consent and urgent referral RT-PCR swab couldn't be taken of this neonate. All the other babies in the study population were

discharged with hemodynamically stable conditions.

Apgar scores in our study group did not differ significantly which is in accordance with observations of other researchers(2,6,10).In our study 2 babies(4.65%) required resuscitation at birth and 3(6.97%) required NICU admission(for respiratory distress) as against 16.2% in other similar study(14). Infants born to SARS-CoV-2-positive mothers seem to be more at risk of moderate respiratory failure than other newborns(10).A large Indian study(21) reported TTNB 5.5% which is inline with our study 4.65%.

In some studies the incidence of NICU admission was exceptionally high (61.9%) and prematurity was the most common cause of such admissions(8,10)while some reported no respiratory distress(14)

In our study 2 newborns (4.64%)had mild requiring oxygen while 1 newborn(2.32%) had severe distress requiring invasive ventilation 2.32%.Amongst other studies 6.93% required NIV, 7.92% required nCPAP, 0.99% required O₂,while no invasive ventilation was required in some studies(8,10).No mortality was noted (8,10)in some studies against our study where 1 succumbed to PPHN.

The limitations of our study were its retrospective design,small sample and non detection of SARS antibody which may play an important role in vertical transmission. 1st and 2nd trimester COVID-19 infections were not studied,limiting our knowledge about adverse outcomes in relation to GA.

Future studies should include larger, multicentre populations and pregnancies at all gestations to obtain more definitive conclusions.

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KVG Medical College and Hospital, Sullia , Karnataka.

Tables: - Characteristics Of Neonates Born To SARS-CoV-2 Positive Mothers-(n=43).

S.No	Characteristics	No.of neonates	%
1.	Gestational Age- a. Late preterm b. Term c. Post-dated	3 37 3	6.97 86.04 6.97
2.	Gender a. Male b. Female	21 22	48.83 51.16
3.	Weight for gestational age- a. SGA. b. AGA. c. LGA.	7 36 0	16.27 83.72 0
4.	Mode of delivery- a. Vaginal b. Caesarean	13 30	30.23 69.76
5.	RT-PCR status- a. Positive. b. Negative. c. Not tested.	1 40 2	2.32 93.02 4.65
6.	Asymptomatic	38	88.37
7.	Symptomatic/adverse outcome within 24 hours. a. TTNB b. Shock c. Probable sepsis d. Culture proven sepsis. e. Fever f. Seizures g. Stillbirth h. PPHN I. Respiratory distress- 1)Mild (Downes <4) 2)Moderate(Downes 4-6) 3)Severe (Downes >7) j. Death. k. Birth asphyxia l. Meningitis. m. Hypothermia n. Poor feeding/lethargy. o. Pneumonia.	5 2 0 1 0 1 0 1 1 2 0 1 1 0 0 1 0 0	11.62 4.65 0 2.32 0 2.32 0 2.32 2.32 4.65 0 2.32 2.32 0 0 2.32 0 0

7.	p. MAS q. Feeding difficulty.	0 1	0 2.32
8.	Requirement of resuscitation at birth.	2	4.65
9.	NICU admission	3	6.97
10.	Meconium stained liquor	4	9.30
11.	Respiratory management- a. Oxygen therapy b. NIV. c. MV.	2 0 1	4.65 0 2.32
APGAR.	Median	Minimum	Maximum.
a. 1'.	9	1	10
b. 5'.	9	3	10
c. 10'	9	4	10

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