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Original Research Article

OUTCOME OF NEONATES BORN TO COVID 19 POSITIVE MOTHERS IN A TERTIARY CARE CENTER IN RURAL AREA OF TELANGANA STATE, INDIA.

Suresh Babu Mendu[1], Subhan Basha Bukkapatnam[2] Aruna Rekha Neela[2], Venu Kota[4], K. Saptharushi[5].

[1] Professor of Pediatrics, Government Medical College, Siddipet, Telangana.

[2] Assistant Professor of Pediatrics, Kakatiya Medical college, Warangal, Telangana.

[3] Associate Professor of Obstetrics & Gynecology, Government Medical College, Siddipet, Telangana.

[4]Assistant Professor of Pediatrics, Government Medical College, Siddipet, Telangana.

[5] Senior resident, Government Medical College, Siddipet, Telangana.

Corresponding Author: Dr. Venu Kota

E-mail: venukotambbs@gmail.com

Abstract

Background: Current evidence is limited on vertical transmission of SARS-CoV-2 and neonatal outcome, thus posing a challenge for preventive strategies. **Objective :** To evaluate clinical outcome of neonates born to mothers with perinatal SARS-CoV-2 infection.

Methods: This prospective observational study was conducted in Govt General Hospital (GGH) Siddipet, Telangana state from 1st June 2020 to 1st Aug 2021. A total of 164 neonates born to SARS-CoV-2 infected mothers were enrolled. Real time polymerase chain reaction (RT PCR) testing was done in first24 hr of life. **Inclusion criteria**: All neonates born to COVID positive mothers. **Exclusion criteria**: Neonates BORN TO COVID Negative mothers and those refused to give informed consent.

Results: A total of 178 neonates were analysed. Mode of delivery was by Caesarian section in most (n = 132, 80.5%) cases. Most of them were asymptomatic and kept on mother side and initiated breast feeding (85.9%). Some were premature (9.8%), low birth weight (18.9%). Few neonates developed respiratory distress (6%), sepsis (15%) and hyperbilirubinemia (24%). Among 178 neonates tested for RT-PCR 1 new born was tested to be positive and had good final outcome without complications.

Conclusion: In our study, the neonatal outcomes were good and hence all the COVID-19–positive neonates were discharged after two consecutive negative RT-PCR tests. Neonates were discharged to a healthy asymptomatic caregiver and were closely followed up for 2 weeks after discharge.

Keywords: Covid 19, Neonates, Outcome. Rural Area.

Introduction

Corona virus disease 2019 is an emerging disease with a rapid spread and increasing mortality .The outbreak of novel corona virus disease was initially noticed in a seafood market in Wuhan city in Hubei province of China in mid-December, 2019has now spread

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worldwide[1] .First case of Covid 19 in India reported in Kerala State on January 27, 2020. On 11 February 2020[2], International committee on Taxonomy of viruses adopted the official name "Severe Acute Respiratory Syndrome Corona Virus 2 (SARS –COV -2). It causes illness ranging in severity from the common cold to severe respiratory illness and death. Limited data are available about Corona virus disease 2019 during pregnancy, outcome and neonatal infections and outcome[3]. The knowledge about the epidemiology, clinical characteristics , presentation and treatment of SARS – COV -2 infection is continuously evolving[4,5] .We report analysis of neonates born to Covid positive mothers from July 2020 to September 2021 at Government General Hospital , Siddipet located in rural area of Telangana

Material and Methods

This is a prospective observational study conducted at Government General Hospital Siddipet from July 2020 to September2021. This study has got approval of Institutional Review Board.Neonates born to women with SARS-CoV-2 infection within two weeks prior to or two days after delivery and neonates with confirmed SARS-CoV-2 infection within 28 days of life were eligible for enrolment in the study.

SARS-CoV-2 infected neonates were defined as those with a positive SARS-CoV-2 quantitative RTPCR test in nasopharyngeal swab within 28 days of birth[5]. SARSCoV-2 infected mothers were defined as those with a positive SARS-CoV-2 quantitative RTPCR test or Rapid antigen test in the nasopharyngeal sample during the peripartum period. A total of 178 neonates born to SARS – COV -2 infected mothers were enrolled and informed consent was taken from the mothers and attendants.

Neonates born to mothers infected with SARS-COV2 within 2weeks prior to delivery, neonatal Covid status was assessed by doing nasal Pharyngeal swab reverse transcription polymerase chain reaction (RT-PCR) test within first 72 hours of life followed by another sample between 5- 7 days period .Perinatal transmission was defined as positive nasopharyngeal RT-PCR in a neonate in the first 72 hours of life after birth .Horizontal transmission was considered with negative RT-PCR within first 72 hours who subsequently tested positive any time after 72 hours after birth .Testing and management were as per the Indian Council for Medical Research (ICMR) and NNF guideline and local standard operating procedures. The data included baseline characteristics of the mothers, mode of delivery, weight of the baby, type of feeding, rooming in with mother with separate attendant with mother to help the baby in PPE KIT or isolation from mother, vaccination, morbidity profile, complications, follow up and neonatal outcomes.The clinical status was classified as per guidelines from the Ministry of Health and Family Welfare; Government of India[1]. In our hospital as per the NNF and local protocols we have kept the neonates born to mothers along with mother in the same room (rooming in) along with healthy attendant tin PPE kit with prior consent for helping the neonate and mother to give expressed breast milk after mother washes her hands with soap and water and usage of sanitizer. Neonates were kept at two feet distant from mother in the same room of mother along with healthy attendant in PPE KIT. In the absence of serial testing and testing of various body fluids from mother, it is not possible to pinpoint the timing of acquisition. It is also to be noted that many neonates were tested for the first time on day 1 as per the local protocols. We have advised to give expressed breast milk to neonate after mother takes all precautions of hand wash, cleaning the breasts and usage of sanitizer and keeping a healthy attendant with their consent and tried to send the RT-PCR nasal swab of neonate as soon as possible. Those who want to give formula feed; we

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gave the option of preferring to breast milk over formula feed, option given to mother after explaining the pros and cons.

The primary outcomes of our study are
1) Incidence of perinatal transmission
2) The rates of SARS – COV2 Virus positivity in neonates in association with risk factors of transmission such as mode of delivery, type of feeding and care practices. And
3) Clinical morbidity and mortality profile of neonates born to Covid 19 positive mothers

Statistical Analysis:
For statistical analysis, continuous variables were described as mean (standard deviation) or median (interquartile range).we used software Epi Info 7.2 for analysis of data.

Results:
A total of 175 pregnant women were included in the study. These cases were followed up during progression of pregnancy and RTPCR test was done as per clinical signs and symptom sand mandatorily for all during labour or C Section. Of the deliveries in the study 163(93.2%) were term, 6(3.4%) were at 35-36wks GA, 5(2.85) were at 33-34wks GA and 1(0.6%) were extreme preterm (<33wks GA). Singleton pregnancy was 98.2 %(172) with only 1.8%(3) were twin pregnancy and triplet and above were not there. In our study Primi mothers were 69(39.4%), followed by second gravid 70(40.%), third gravid are 30(17.1%) and forth and above gravid were 6(3.4%).

Table 1 : Gestational characteristics

Gestation age		
28- 32	1	0.6%
33-34	5	2.8%
35 – 36	6	3.4%
>37	163	93.2%
Gestation		
Singleton	172	98.2%
Twin	3	1.8%
Parity		
Primi	69	39.4%
G2	70	40.1%
G3	30	17.1%
G4+	6	3.4%

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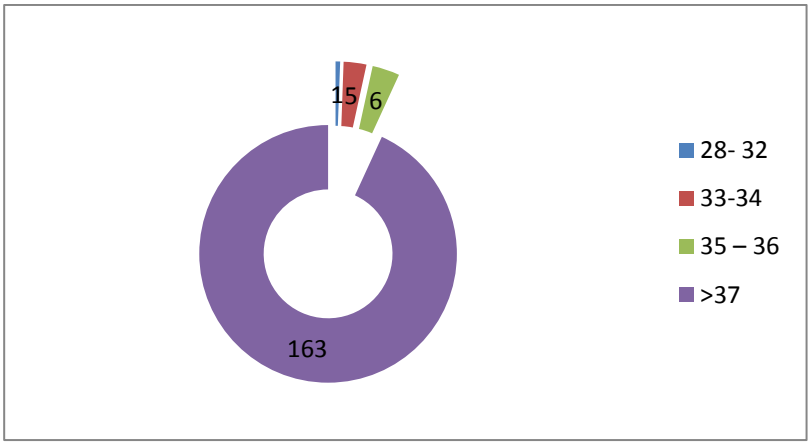

Figure 1 : Gestation age

Table 2 : Delivery method

Deliveries	n	percentage
NVD	36	20.5%
LSCS	139	79.5%
Total	175	

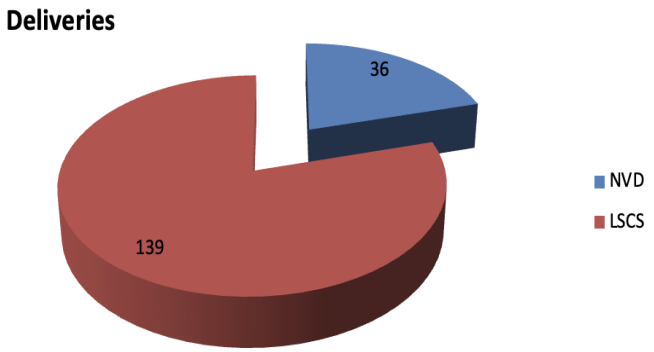

Figure 2 : Deliveries

A total of 139(79.5%) cases were delivered through Cesarean section and rest 36(20.5%) were delivered through vaginal delivery. The indication for Cesarean delivery includes previous LSCS (87), Oligohydramnios(40), fetal distress (12), Non progression of labour(11), CPD(10), PROM(6), IUGR(5) & Breech presentation (4)

Table 3: Indication for Cesaerean section

Indication for Cesaerean section		
Previous LSCS	87	49.7%
Fetal Distress	12	6.9%
CPD	10	5.7%
Breech Presentation	4	2.3%
Non progressive labour	11	6.2%
Oligo	40	22.9%
IUGR	5	2.9%
PROM	6	3.4%

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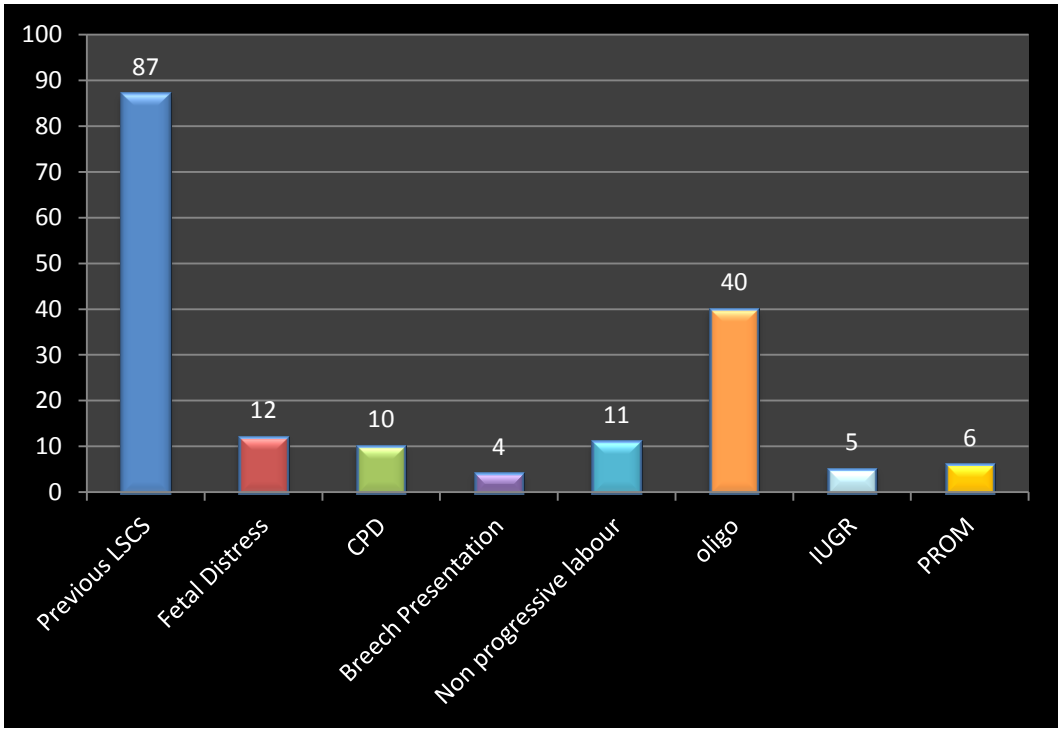

Figure 3: Indication for Cesaerean section

RTPCR was done to all pregnant women just before delivery or as and when suspicion of Covid 19 clinically. In our study150 pregnant women were identified with Covid 19 within 7 days of deliveryand 25 developed positive RTPCR between 8 – 14 days of delivery.

Table 4 : Viral detection time

Viral detection to Delivery time		
<7 days	150	85.7%
8 – 14 Days	25	14.3%
>14 Days	0	

Of all the deliveries 150(84.2%) babies were term and 28(15.8%) were preterm of which 59(33.1%) babies were low birth weight and 119(66.9%) are appropriate for gestation age

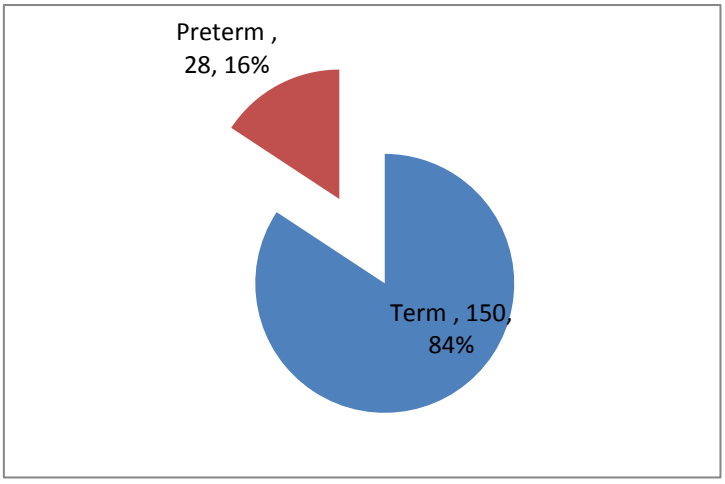

Figure 4: Neonatal characteristics

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Table 5: Neonatal characteristics

Maturity		
Term	150	84.2%
Preterm	28	15.8%
Birth Weight		
<1500gms	5	2.8%
1500 – 2500gms	54	30.3%
>2500gms	119	66.9%
Sex		
Male	88	49.4%
Female	90	50.6%
APGAR Score at 5 min		
1-6	8	4.5%
7-10	170	95.5%

Males are 88(49.4%) and females are 90 (50.6%) with M:F ratio almost to 1 in this study. APGAR score taken at 5minutes showed 170(95.5%) babies with a score between 7-10 and 8(4.5%) babies recording a score of below 6.

Table 6: Feeding methods

Feeding		
Breastfed	153	85.9%
Mixed fed	25	14.1%

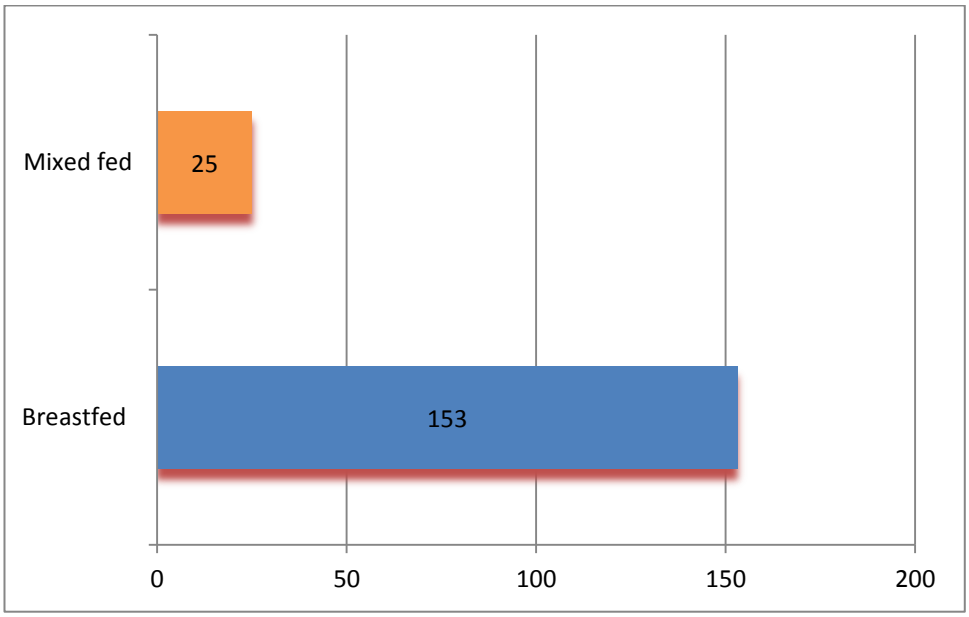

Figure 5: Feeding methods

Of the 178 babies 153(85.9%) were exclusively breastfed and 25(14.1%) were mixed fed.
All the babies are kept in isolation ward with rooming in with mother and healthy attendant donning PPE kit to take care of the baby. 35 babies developed clinical sepsis which was managed by empirical antibiotics, delayed transition (TTNB) is seen in 11 babies who required oxygen supplementation for less than 48 hours and recovered, phototherapy for neonatal hyperbilirubinemia was given in 40 babies.

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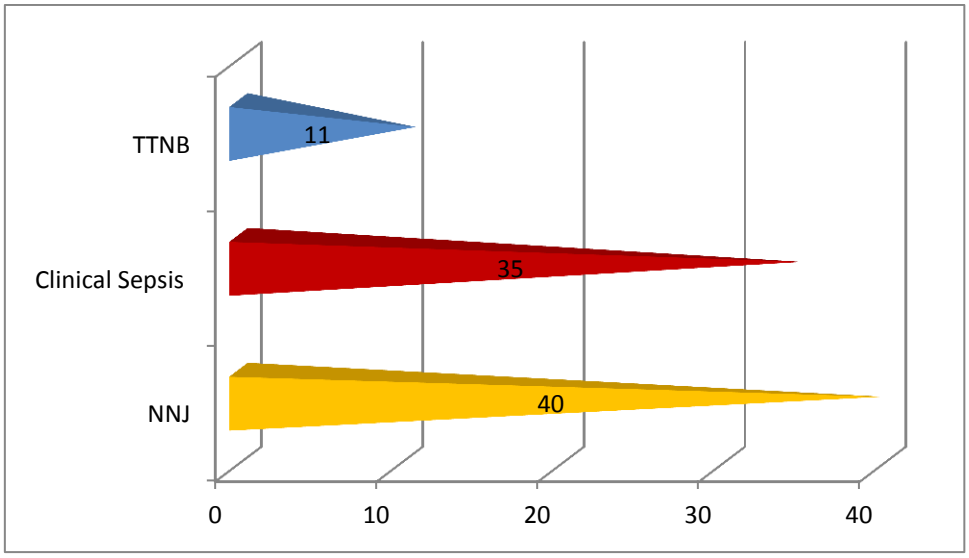

Figure 6 : clinical characteristics

For all the 178 babies of our study group, nasopharyngeal swab for Covid RTPCR were sent within first 24hours of life. Only 3(1.7%) babies tested positive in the initial sample.

1. First baby is born of twin gestation 1/primi/term/IUGR/LBW/CIAB/Fch with birth weight of2kg. Baby was in stable condition not requiring oxygen and was mixed fed. Baby developed hyperbilirubinemia for which phototherapy was given for two days. Baby was discharged on day 7 of life with repeat RTPCR on day 6 came as Negative. The twin 2 is tested negative on two consecutive RTPCR samples taken 24 hours apart first sample taken within 24hrs of birth.
2. Second baby is born to G2P2L1/ Term/LSCS/AGA/CIAB/FCH with birth weight of 3.2kg. Baby was in stable condition not requiring oxygen and was exclusively breastfed. Baby developed hyperbilirubinemia for which phototherapy was given for two days. Baby was discharged on day 9 of life with repeat RTPCR on day 8 came as Negative.
3. Third baby is born to G2P2A1/ Term/NVD/AGA/CIAB/MCH with birth weight of 3.1kg. Baby was in stable condition not requiring oxygen and was exclusively breastfed. Baby was discharged on day 6 of life with repeat RTPCR on day 5 came as Negative.

All the babies were vaccinated as per vaccination guidelines before discharge. No mortality was seen in the present study population.

Discussion

As the studies on neonatal outcome of babies born to COVID 19 positive mothers were few and even fewer in rural areas our study will give a prospect on the rural statistics of COVID-19 neonatal morbidity and mortality and perinatal transmission. All the neonates born to COVID-19–positive pregnant women were admitted to the isolation ward and tested for COVID-19 as soon as possible (i.e., within 24 h of delivery or within 24 h of the mother testing positive for COVID-19, whichever was earlier). All The mothers and their neonates were kept away from each other after delivery as per the recommendations formulated by the American Academy of Pediatrics[6] Centers for Disease Control and Prevention, and Chinese expert consensus.[7]To decrease the risk of perinatal transmission, they advise to isolate the neonates immediately after delivery, provide formula feed or EBM, and maintain no contact[8], if possible. This recommendation is in contrast to the recommendation by the WHO[9], COVID-19–positive neonates were observed for symptoms during their hospital stay, and all remained asymptomatic. As per the guidelines[10], in our study, the neonates were given EBM

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or formula feed in case of nonavailability of EBM. After both the neonate and the mother tested negative for COVID-19, direct breastfeeding was allowed, and they were kept together. Thereafter, breastfeeding was encouraged and reinforced at discharge and at follow-up after 14 days (at least once or as required based on the neonates' condition) Majority of the neonates (99.9%) born to COVID19–positive mothers were COVID-19 negative in our study. Although they did not have symptoms related to COVID-19, they had other illnesses, that is, 5% had TTNB ,and 20% had septicemia; and 22% had NNJ the remaining 60-70% were healthy.

Conclusion

In our study, the neonatal outcomes were good and hence all the COVID-19–positive neonates were discharged after two consecutive negative RT-PCR tests. Neonates were discharged to a healthy asymptomatic caregiver and were closely followed up for 2 weeks after discharge.

Source of Funding: Nil
Conflicts of Interest: Nil

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