

The perinatal outcome in pregnancies with Novel Corona Virus 19 infection - A pilot study

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Abstract: *Introduction:* All over the world, life has been drastically altered due to Novel Corona Virus 19 (Covid-19) infection. As of today, nearly 39 million people are affected with a mortality of 3%. In India, the total number of cases have crossed 5 million with a mortality of 1.7%. This study was taken up to assess the effect of Covid-19 infection during pregnancy and neonatal outcome. *Material and Methods:* This study was done at Shifaa Hospital, Bangalore from June to August, 2020. Two hundred and ten mothers delivered babies with three sets of twins. Of these 210 mothers, 51 tested positive for Covid-19. Mode of delivery was documented. APGAR score, gestational age and weight of the newborns were noted. All asymptomatic neonates were shifted towards the mother side and breastfed. Symptomatic neonates were admitted to the NICU. Covid-19 swabs were taken for 37 neonates belonging to Covid-19 positive mothers between 24 to 48 hours of life. Repeat swabs at day 8 to day 10 were suggested. All the neonates were followed up after day 14. *Results:* The incidence of Covid-19 positivity was 24.28% among pregnant ladies. Majority of the mothers were asymptomatic with only 2 mothers having influenza like symptoms (ILI). The rate of caesarean section was higher compared to normal vaginal delivery. The mean birth weight of the babies in Covid-19 positive mothers was significantly lower than that of the Covid-19 negative mothers. Out of the 37 neonates tested for Covid-19, 3 were positive but remained asymptomatic at 14 day follow up. Thirty five neonates of the total 210 deliveries required NICU admission. Six neonates born to Covid-19 positive mothers were admitted in the NICU, out of which five had transient tachypnoea which resolved within 24 hours. Fifty neonates were born low birth weight, fifteen of them being born to the Covid-19 positive mothers. All babies were asymptomatic at follow up after 14 days. *Conclusion:* In our study, Covid-19 infection had no significant effect either on pregnancy or on the neonate except for a marginal decrease in the birth weight of the neonates of the Covid-19 positive mothers.

Keywords: Covid-19, Neonate, Pregnancy.

Introduction

Corona virus disease (Covid-19) caused by Severe Acute Respiratory Syndrome Corona virus-2 (SARS-COV-2) has created havoc worldwide since December 2019, first reported in Wuhan, China[1]. Being a global pandemic, it is spreading fast, affecting all age groups across the world. In India, the total number of cases have crossed 5 million with a mortality of 1.7%.

In Bangalore, a cosmopolitan city of South India, the number of people affected with Covid-19 disease increased from May 2020 onwards peaking by July-August 2020. Pregnant ladies were exposed to a new risk of Covid-19 infection. Viral infections during pregnancy are known to

have an adverse effect on both the perinatal and neonatal outcome [2]. This study was undertaken to observe the perinatal outcome of Covid-19 infection in pregnancy.

Material and Methods

A prospective observational study was undertaken at Shifaa Hospital, Bangalore for a period of 3 months from June to August, 2020. On an average, the total number of deliveries are approximately 1300 per year. In our study, all pregnant ladies who were due for delivery were included. During the study period, initially in the month of June, all pregnant mothers, belonging to a containment zone, who were due for labour, were tested for

Covid-19. Those mothers who were asymptomatic and not from the containment zone were not tested for Covid-19 in the month of June. However, as the number of cases increased, all mothers were mandatorily screened for Covid-19 by using commercial ICMR approved Real Time-Polymerase Chain Reaction (RT-PCR) Kit/US FDA EUA/ CE IVD or Rapid Antigen Test done by the Bruhat Bengaluru Mahanagara Palike, in accordance with the Indian Council of Medical Research [3].

All mothers were designated as Covid-19 Negative, Covid-19 Suspect or Covid-19 Positive based on the screening results. Covid-19 Suspects were those ladies who had come to the hospital in active labour and their samples were sent for Covid-19 test after admission to the hospital.

After the results of the swab, they were classified as Positive or Negative. Deliveries were conducted in three different labour rooms or operation theatres, each being Negative, Suspect and Positive, based on the Covid-19 status of the mothers. Mode of delivery, Apgar score, Gestational Age and Weight of the newborn were documented. Asymptomatic neonates were shifted to the mother's side for rooming in and breastfeeding. Covid-19 positive and suspect mothers were advised to breastfeed the baby with universal precautions along with N95 masks on. Babies who required NICU admission as per the hospital protocol were admitted in separate Covid-19 Negative or Positive NICU depending on the maternal Covid-19 status.

Nasopharyngeal swabs for Covid RT-PCR were taken at 24-48 hours of life for all neonates born to Covid-19 Positive mothers. Repeat swab test was advised between Day 8 and Day 11 of life to all neonates. Asymptomatic neonates were discharged at 48-72 hours of life and advised to review for follow up on Day 15 of life or earlier if any symptoms developed, with the repeat Covid RT-PCR report. The mothers were grouped into Covid-19 positive and Covid-19 negative after the test results. The data was analyzed using Microsoft excel Data Analysis software. The *t* test with the two samples assuming unequal variances and *z* test was used to compare the mean birth weight of Covid-19 negative and positive mothers. A *p* value of <0.05 was taken as statistically significant.

Results

During the study period of 3 months, 210 mothers delivered, out of which 3 mothers gave birth to twins. Covid RT-PCR was done in 172 mothers and Rapid Antigen Test was done in 11 mothers. One hundred and thirty mothers were tested negative for Covid-19 and 51 mothers tested positive for Covid-19. Test was not done in 27 mothers as they were asymptomatic and belonged to non-containment areas. Two of 51 mothers developed ILI symptoms whereas all others were asymptomatic. Nine of the mothers were Positive for Covid-19 ten to twelve days prior to the date of delivery and 5 mothers were positive 2-4 weeks prior to the delivery date. Rate of Caesarean sections was 52.22% (n=82) among the Covid-19 negative deliveries and was 62.74% (n=32) among the Covid Positive mothers with a *p* value of 0.102 (not significant)

A total of 213 neonates were born, out of which 53 neonates belonged to Covid-19 positive mothers. Apgar scores at 1 minute ranged from 7-10 in all babies. Three neonates had Apgar less than 7 of which 2 improved within 24 hours and one neonate had hypoxic ischemic encephalopathy. None of the neonates born to Covid-19 positive mothers had Apgar of less than 7.

The birth weight of the neonates ranged from 1620gm to 3640gm (*Mean of 2714gm with a variance of 0.166gm*) and 1620 to 3620gm (*mean of 2840gm with a variance of 0.217gm*) in the Covid-19 positive deliveries and Covid-19 negative deliveries respectively. Using one tailed *t* test, the *p* value was 0.032 and *z* score was 0.030, both being statistically significant. Babies weighing less than 2500 grams constituted 22.29% (n=35) and 29.41% (n=15) among the Covid-19 negative and positive mothers respectively. Prematurity constituted 7% (n=11) and 5.8% (n=3) of the Covid-19 negative and positive mothers. Respiratory Distress was seen in 8.28% (n=13) and 11.7% (n=6) among the Covid-19 negative and positive mothers, respectively. Table 1 shows the various parameters in both Covid-19 positive and negative mothers with the *p* value. Nasopharyngeal swabs for Covid RT-PCR was sent in 37 neonates at 24-48 hours of

life among which 3 neonates tested positive for Covid-19. None of the parents complied to repeat

the Covid RT-PCR test for the previously tested positive babies at Day 8-Day 11 of life.

Outcome	Covid19 negative	Covid19 positive	P value (<0.05 significant)	
Cesarean section	82	32	0.102	>0.05
Mean birth weight	2840gm	2714gm	0.030	<0.05
Low birth weight	35	15	0.187	>0.05
Preterm	11	3	0.633	>0.05
Respiratory distress	13	6	0.252	>0.05

Discussion

Covid-19 disease is an emergent infection caused by SARS-COV-2 virus that has had a negative impact on the health of the society at large. In Bangalore, the Covid-19 spread increased from May 2020 onwards peaking in July- August. Twenty seven mothers were not tested for Covid-19. Majority of them (n=27) were not from the containment zone in the initial months of infection and thus they were not tested, in accordance with the ICMR/ BBMP guidelines [4]. Fifty one mothers were positive for Covid-19 with an incidence of 24.28%. Our incidence is higher as compared to Nayak AH et al (14.43%) and Sutton D et al (15%), because we have included all those mothers who were positive for more than ten days to one month back, as positive for Covid-19 [5-6]. Also the patients who visit our hospital belong to low economic strata of the society, with many patients form the containment zone and the study period included the peak season.

In our study, only 2 of the mothers had ILI symptoms with majority of them being asymptomatic (96%) similar to Nayak et al (97%). A study by Breslin et al from New York reported 71% of asymptomatic mothers developed symptoms in post partum period [7]. San Juan et al from Spain reported 61.5% of the pregnant ladies to be symptomatic [8]. Genetics, age and the individual immunity to the virus determines the symptomatology of Covid-19 patients [9]. This is the reason for the majority of the Covid-19 positive mothers in our study to be asymptomatic. The rate of cesarean section was slightly higher than the normal deliveries, the reason being obstetric indications. However, studies from China reported 80-100% caesarean sections in Covid-19 positive mothers, in order to

reduce the risk of spread of Covid-19 infection, as it was the epicenter for the pandemic origin [10-11].

All babies had good APGAR scores. Mean birth weight of the neonates were lesser in the Covid-19 positive mothers. There was no much difference in the incidence of low birth weight babies, prematurity and respiratory distress syndrome between the Covid-19 positive and negative mothers. This was similar to a study by Zhang et al and a review by Zarchi MK et al who found that there was no difference in the fetal distress, meconium stained amniotic fluid, preterm deliveries and neonatal asphyxia between Covid-19 positive and negative mothers [12-13]. Majority of the neonates admitted to NICU were mainly for isolation from the infected mother or due to other morbidities unrelated to Covid-19 infection, as per the guidelines of FOGSI, IAP and NNF [14].

All of the neonates were asymptomatic at birth and after 14 days follow up similar to that reported by Nayak et al. Fever, cold, lethargy, respiratory distress, vomiting, diarrhoea and poor feeding have been reported in SARS-COV-2 infection in neonates [5]. Sixteen neonates were not tested as their mothers were positive for Covid-19 about 10-14 days prior to delivery. After 10 days of a positive test, there is low infectivity and low risk of virus transmission to the neonate from the Covid-19 positive mother [15]. All fifty three babies followed up on day 15 of life were found to be healthy and growing well.

Limitations: In the initial months, universal screening of all pregnant mothers due for delivery, was not done. Repeat testing by RT-

PCR was not done in mothers who came with the result of a negative Rapid Antigen test report owing to financial constraints. All asymptomatic mothers who were not tested were also included under the Covid-19 negative group. Repeat swab testing was not done as neonates were asymptomatic and parents were not compliant. We have considered mothers who were positive for more than ten days as Covid-19 positive for the study, though the infectivity and rate of transmission is low in such patients.

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Conflicts of interest: There are no conflicts of interest.

Conclusion

In our study, majority of the Covid-19 positive mothers and all of the neonates were asymptomatic. Covid-19 infection had no significant effect either on pregnancy or in the neonate. Vertical transmission is found to be low. Further neonatal follow up studies are required to know the long term sequelae of viral infections during pregnancy.

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