

Clinical Outcomes of COVID-19-positive Pregnant Women Admitted for Delivery at a Tertiary Care Center, Chamarajanagar

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ABSTRACT

Purpose: The purpose of the study is to determine the maternal and fetal outcomes among the coronavirus disease-2019 (COVID-19)-positive pregnant women.

Methodology: This is a retrospective cross-sectional study conducted among all the COVID-19 pregnant women who were admitted at Chamarajanagar Institute of Medical Sciences for delivery.

Results: The mean age of the study subjects was 26.00 ± 4.89 years, and it ranged between 19 and 37 years. Most of the patients were gravida 2 (51.6%) and primigravida (41.9%); Lower segment cesarean section was the commonest mode of delivery (38.7%). Cough and breathlessness were the symptoms recorded in 1.6% of the patients. Premature rupture of membranes (PROM) (9.7%) and decreased saturation (6.5%) were the maternal complications noted. A majority of the neonates weighed 2.5–3.5 kg (46/63, 73.0%). The mean birth weight of the neonates was 2.97 ± 4.89 kg with the minimum weight recorded being 1.75 kg and maximum was 3.8 kg. The commonest neonatal complication (14.3%) noted was low birth weight (LBW), and among them, eight of them had COVID-19 negative status but for one who was diagnosed COVID-19 positive. There were no deaths recorded among both mother and the neonates.

Conclusion: Our results suggest that there are no maternal and neonatal deaths noted among COVID-19 pregnant women, and PROM and decreased saturation were the maternal complications affecting 10.0 and 7.0% of them and LBW was the neonatal complication found among 14.0% of them. Vertical transmission cannot be ruled out 100.0 as 1.6% (1/63) newborn was found to be COVID-19 positive.

Keywords: COVID-19, Maternal outcome, Neonatal outcome, Pneumonia, Vertical transmission.

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INTRODUCTION

Pregnancy is a condition which commonly alters the body's immune system and also the response to viral infections. It can occasionally be related to more severe symptoms, and this holds good even for coronavirus disease-2019 (COVID-19).¹ Viral pneumonias, the most common nonobstetric infectious disease during pregnancy, are known to be associated with maternal and neonatal morbidity and mortality during pregnancy. COVID-19 disease, an atypical viral pneumonia caused by severe acute respiratory syndrome corona virus-2 (SARS-COV-2), is highly infectious and has become a pandemic.² As of September 7, 2020, globally, there are 27,032,617 confirmed cases of COVID-19, including 881,464 deaths, and South-East Asia has 4,787,009 cases, and India reports 4,204,613 confirmed cases cumulative deaths of 71,642.³ Similarly, Karnataka has been reported with 404,324 cases and 6,534 COVID deaths. Our district reports 2,673 cases and 43 deaths.⁴ Centers for Disease Control and Prevention (CDC) reports 20,216 COVID-19 cases among pregnant women and 44 deaths in the United States.⁵ However, published newspaper articles reveal that by August 12, 2020, there were 200 COVID-19 positive cases who have delivered in Bengaluru.⁶ Earlier, it has been stated that the risk of infection among pregnant individuals were same as compared with that in nonpregnant individuals in the general population. However, recent findings suggest that among the women with COVID-19, pregnant women appeared to be at increased risk for certain manifestations of severe illness compared to nonpregnant peers.⁷ Moreover, severe acute respiratory syndrome (SARS) during pregnancy has been linked previously with a high risk of spontaneous miscarriage, preterm birth, and intrauterine growth restriction.⁸ The The Indian Council of Medical Research (ICMR) guidance document has reported

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preterm birth in women with COVID-19 according to case reports.¹ Many studies are focusing on infected individuals from the general population, and very limited literatures are available on pregnancy outcomes for women with COVID-19,² especially in this part of Karnataka. Hence, we have conducted this study to determine the maternal and fetal outcomes in COVID-19 positive pregnant women who delivered at a tertiary set up in Chamarajanagar.

METHODOLOGY

A retrospective cross-sectional study was conducted among all the COVID-19 pregnant women who were admitted at Chamarajanagar Institute of Medical Sciences for delivery until September 30, 2020. An approval was obtained from Institutional

Ethics Committee bearing reference number CIM/IEC-02/40/2020. Details on sociodemographic data like name and age, details on symptoms of COVID-19, and obstetric history with the expected date of delivery and outcomes were obtained from the records. The study outcomes among mothers were occurrence of complications viz., thromboembolism, MI, ARDS, maternal death, and any other complications, and among the neonates, the outcomes were positivity of neonates indicating vertical transmission, preterm births, small for gestational age (SGA), low birth weight (LBW), neonatal asphyxia, and neonatal deaths. The management of the positive pregnant women and the neonates was done according to the standard COVID-19 management protocol.⁹ All the results were entered into MS Excel, and the continuous data were expressed in mean \pm SD, and the discrete data were expressed in proportions/percentages.

RESULTS

The mean age of the study subjects was 26.00 ± 4.89 years, and it ranged between 19 and 37 years (Table 1). A majority of the patients were gravida 2 (32/62, 51.6%) followed by primigravida (26/62, 41.9%) and gravida 3 and gravida 4 (2/62, 3.25% each). There was one twin gestation among the pregnancies (1/62, 1.6%). The commonest mode of delivery was lower segment cesarean section (LSCS) (24/62, 38.7%), and normal delivery was conducted in 38 (61.3%) women (Figs 1 and 2). LSCS was conducted for the varied indications, the commonest being previous LSCS, failure to progress, cephalopelvic disproportion (CPD), premature rupture of membranes (PROM) with CPD, and oligohydramnios and anemia (Table 2). There were no neonatal deaths recorded, and most of the

neonates were males (36/63, 57.1%), and a majority of the neonates weighed 2.5–3.5 kg (46/63, 73.0%). The mean birth weight of the neonates was 2.97 ± 4.89 kg with the minimum weight recorded being 1.75 kg and maximum was 3.8 kg (Table 1).

PROM was the commonest maternal complication (6/62, 9.7%) among whom only PROM was noted among five and one had PROM [25-year-old G2P1L1 with 32 weeks gestation with previous LSCS delivered via lower segment cesarean section (LSCS)] with decreased saturation of 76% at room air (RA). The patient was shifted to the intensive care unit (ICU) and was put on noninvasive ventilation (high-flow oxygen) and the saturation maintained at 90% and injections remdesivir, enoxaparin, ceftriaxone, methyl prednisolone, and vitamin C were started along with tablet zinc. After 8 days in the ICU, she was shifted to the high-density unit with continued oxygen for 5 days and later to the COVID ward and was observed for 4 days and was discharged uneventfully (Table 3).

Totally, four had decreased saturation (4/62, 6.5%) among whom only three of them developed decreased saturation alone (3/62, 4.8%). One of those was a 21-year-old full-term primigravida with CPD, pregnancy-induced hypertension (PIH), and anemia

Table 1: Sociodemographic profile of the study subjects

Sociodemographic details	Frequency (n)	Percentage (%)
Age-group in years (n = 63) (26.00 ± 4.89 years) (19–37)		
≤ 20	07	11.2
21–25	29	46.8
26–30	13	21.0
> 30	13	21.0
Gender of the newborn (n = 63)[§]		
Male	36	57.1
Female	27	42.9
Weight of the newborn at birth in kg (n = 63)[§] (2.97 ± 4.89 kg) (1.75–3.8)		
< 2.5	09	14.3
2.5–3.5	46	73.0
> 3.5	08	12.7

[§]n = 63 as there was one twin gestation

Table 2: Indications of LSCS among the mothers who underwent LSCS (n = 38)

Indications for LSCS	Frequency (n)	Percentage (%)
Failure to progress with or without PROM/CPD	14	36.9
Previous LSCS with or without PROM	17	44.7
Postdated pregnancy	5	13.2
Precious pregnancy	1	2.6
Pregnancy-induced hypertension with anemia	1	2.6
Total	38	100.0

PROM, premature rupture of membranes; CPD, cephalopelvic disproportion

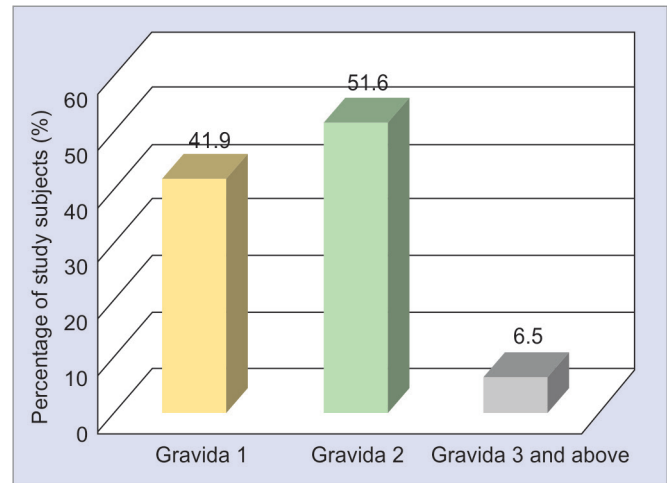


Fig. 1: Distribution of the study subjects based on the gravida status

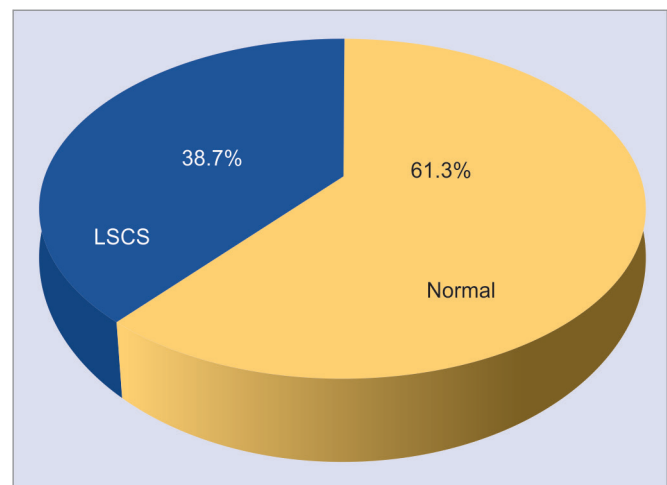


Fig. 2: Distribution of the study subjects based on the mode of delivery (n = 62)

Table 3: Perinatal outcomes of the study subjects

Perinatal outcomes/complications	Frequency (n)	Percentage (%)
Maternal (n = 62)		
PROM	05	8.1
Decreased saturation	03	4.8
Breathlessness/decreased saturation with PROM	01	1.6
Fetal (n = 63)[§]		
Low birth weight	8	12.7
COVID-19-positive neonate with low birth weight	1	1.6

[§]n = 63 as there was one twin gestation; PROM, premature rupture of membranes

who delivered via LSCS developed postpartum eclampsia on postoperative Day 1. MgSO₄ loading dose was started and on postoperative Day 2; the patient was drowsy and on Day 3, she developed continuous seizures with left-sided hemiparesis following which injection Eptoin, Levipil, and methyl prednisolone were given. Saturation decreased to 80% at RA. The patient was shifted to the ICU and was put on noninvasive ventilation (high flow oxygen), and the saturation maintained at 90%. The patient was treated according to the standard COVID-19 treatment protocol, and the patient recovered completely on Day 7 and was discharged on 14th day (Table 3).

Another study subject who had decreased saturation was a 35-year-old G2P1L1 with previous LSCS and failure to progress complained of cough who developed breathlessness on Day 2 with saturation 86% at RA. With a nonbreather mask (NRBM), 94% saturation was attained. She was prescribed with N-acetyl cysteine, and she recovered completely (Table 3).

Lastly, a 31-year-old mother with an obstetric score of G3P2L2 delivered via normal delivery was noted with decreased saturation on Day 2 with saturation 86% at RA. With a nonbreather mask (NRBM), 94% saturation was reached and was discharged on Day 7 uneventfully (Table 3).

The commonest neonatal complication (9/63, 14.3%) noted was LBW, and among them, eight of them had COVID-19 negative status but for one who was diagnosed COVID-19 positive. The baby was kept in neonatal intensive care units (NICU) and was observed and discharged uneventfully (Table 3).

DISCUSSION

There have been very limited studies on determining the impact of COVID-19 in the current situation of pandemic among vulnerable population like pregnant women and the newborn. This study throws light on the maternal and neonatal outcomes of COVID-19 pregnant mothers. The age of the study participants ranged from 19 to 37 years, wherein two of them, i.e., 3.3% of them, were 19 years. Similarly, National Family Health Survey-4 (NFHS-4) data indicate that in Karnataka, 7.8% of them in the age group of 15–19 years were already mothers or pregnant at the time of the survey.¹⁰ Hassan et al., in their study, reported the mean age of the study subjects as 27.3 ± 4 years and two of them had risk factors in the form of diabetes and PIH. The mean age of the study subjects in this study was 26.00 ± 4.89 years, and eight of them, i.e., 12.9% had risk factors like PIH, oligohydramnios with anemia, postdated, and twin gestation.¹¹ However, none of them were reported to have gestational diabetes in ours which might be because of different

sociodemographic profile of the patients. Shah et al. found higher proportions to be multigravidae and is in line with our study findings.¹² Nayak et al. also reported LSCS to be the commonest mode of delivery, and it was performed for those with only obstetric indications similar to our study. The varied obstetric indications in our study were previous LSCS (commonest), failure to progress, CPD, PROM with CPD, and oligohydramnios and anemia.¹³

Except for 4 among 62 patients, i.e., 6.5% patients, all remained asymptomatic, and one of those four developed cough and breathlessness (1.6%). Ninety-seven percent of them, according to Nayak et al., were asymptomatic or had mild symptoms like fever or cough and did not require any oxygen therapy.¹³

Muhidin et al., in their systematic review, concluded that there might be increased risk of Premature rupture of membranes (PROM) with the onset of COVID-19 in the third trimester of pregnancy.¹⁴ Concordantly, premature rupture of membranes (PROM) was the commonest maternal complication (6/62, 9.7%) among our subjects, and one of them (1.6%) had both PROM and decreased oxygen saturation.

The oxygen saturation was noted to be decreased among (4/62, 6.5%) in ours, and the risk of severe pneumonia during the period of pregnancy is noted to be high as highlighted by Nayak et al. Additionally, they have mentioned about the WHO report, wherein the adverse pregnancy outcomes were more noted among those with other associated diseases such as preeclampsia or other complications as the respiratory syndromes may aggravate pulmonary edema and decrease oxygen saturation.¹³ In our study, 12.9% had risk factors like PIH, oligohydramnios with anemia, postdated pregnancy, and twin gestation.

Hassan et al. concluded that pregnancy increases the risk of several adverse outcomes which even included LBW.¹¹ The commonest neonatal complication (14.3%) noted in our study was LBW. Similarly, Dubey et al., in a systematic review and meta-analysis, noted LBW in 23% of them.¹⁴

Similar to the reported findings by Zaigham and Andersson in terms of vertical transmission, its occurrence cannot be ruled out in our study too, as one neonate was found to be positive but no neonatal deaths were recorded in the current study.¹⁵

CONCLUSION

PROM and decreased saturation were the maternal complications which affected 10.0 and 7.0% of the study subjects, respectively, and LBW was the neonatal complication found among 14.0% of them. However, there were no mortalities among both mother and the neonates during the early neonatal period. With one case of COVID-19 being positive (1/63, 1.6%), the possibility of vertical transmission cannot be totally ruled out.

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