

An Observational Study of Maternal and Perinatal Outcome of 300 Covid-19 Positive Pregnant Women

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Abstract

Background: WHO declared coronavirus disease 2019(COVID-19) as a public health emergency of International concern on January 30,2020¹. Coronavirus disease 19(COVID-19) has become a global pandemic

Aim: To study the effects of COVID-19 on maternal and perinatal outcome.

Materials and Methods: Retrospective study was conducted in obstetrics and gynecology department, gandhi hospital,Secunderabad. Studied medical records of 300 pregnant women diagnosed with COVID-19,who delivered between 01-05-2020 to 31-08-2020.

Results: Out of 300 pregnant women, 176(58%) in the age group of 21-25 years.80.8% patients were asymptomatic. In symptomatic patients (19.2%) common presenting complaint was Dry cough (11.3%). Majority of patients (78%) were diagnosed with RT-PCR.60 presented with comorbidities hypothyroidism being most common(40%).Corticosteroids were given for 44 patients (14.6%),12(4%) patients for fetal lung maturity and 32(10.6%) patients for maternal lung inflammation admitted in ICU.207(69%) caesarean and 93(31%) vaginal deliveries.Previous caesarean section followed by fetal distress are the most common indications.252(84%) term deliveries (>37weeks) and 48(16%) preterm (<37weeks) deliveries.³² were admitted in maternal intensive care unit(10.6%) and 7 maternal deaths, 3 Neonatal deaths and 2 Intrauterine fetal deaths were reported.

Case fatality rate was 2.3% for pregnant women and 1% for neonates.Out of 298 alive babies,9 COVID-19 positive and 289 COVID-19 negative.None of these neonates had contact with infected mothers except during delivery, which suggests vertical transmission risk(3%).

Conclusion

- 97.66% of mothers and 98.3% neonates discharged without any complications.10.6% maternal morbidity and Case fatality rate 2.3% for pregnant women and 1% for neonates.
- Maternal-fetal transmission risk(3%) of SARS-COV-2.
- Careful monitoring of pregnancies with COVID-19 and measures to prevent neonatal infection was warranted.

Keywords: COVID-19; RTPCR; ICU; Oxygen Saturation; Corticosteroids.

Introduction

In December 2019, a case of unidentified Pneumonia was reported in Wuhan, Hubei Province, People's Republic of China (PRC) centers on disease control declared the Pneumonia as Novel Corona Virus².

WHO declared coronavirus disease 2019(COVID-19) as a public health emergency of International concern on January 30,2020¹.

Coronavirus disease 19(COVID-19) has become a global pandemic with 2,51,18,689 number of cases worldwide, India recorded 36,21,245 cases as on 31/08/2020³.

The causative agent is SARS-COV2. It's a single standard RNA enveloped virus, causing various degrees of illness ranging from the common cold to Pneumonia and Acute Respiratory Distress⁴.

The physiological changes occurring during pregnancy make the mother more vulnerable to severe infections⁵. Asymptomatic women and women with mild disease have fewer complications⁶. For COVID-19 positive patients with mild to moderate symptoms, severity of disease peak often in the second week⁶. Women with tachypnea (RR >30/min), hypoxia (spo₂<94%) and >50% lung involvement on imaging must be admitted in critical care unit⁷.

FOGSI recommends Hydroxychloroquine 600mg, Azithromycin 500mg, for ten days in pregnancy in addition to supportive treatment. In high risk women with uncontrolled diabetes, Immuno suppression or chronic disease antivirals and antibiotics may be used.⁸

RCOG advice, mode of delivery should be on obstetric indication, and not presumed protection of baby against infection.^{7,9} Maternal disease progression, gestational age fetal intrauterine status is the primary concern.¹⁰

Newborns of positive mothers suspected to be COVID 19 should be transferred to the neonatal isolation ward immediately after being evaluated by neonatologists.^{10,11} CDC recommends women to express breast milk during isolation to establish and maintain milk supply.

In this retrospective study, We analyzed maternal and neonatal outcomes of 300 COVID-19 confirmed cases delivered in Gandhi hospital.

Aim of the Study

To study the effects of COVID-19 on maternal and perinatal outcome.

Objectives

1. To study the maternal and perinatal outcome in COVID-19 cases.
2. To study the vertical transmission risk.

Material and Methods

A Hospital-based retrospective study was conducted in the department of Obstetrics and

Gynecology, Gandhi Medical College and General Hospital from 1st May 2020 to 31st August 2020. Medical records of 300 pregnant women who were diagnosed with COVID-19 and gave birth between 01-05-2020 to 31-08-2020 in Novel COVID-19 Tertiary center were studied.

Maternal data: We collected socio demographic data, obstetric and medical history, Laboratory tests, ICU admissions, mode of delivery and complications.

Neonatal data: Data collected include sex, birth weight, 1 and 5 minutes APGAR scores, complications, feeding details, qRTPCR test of neonates.

Inclusion Criteria

Confirmed COVID-19 pregnant women, attending to the Department of Obstetrics and Gynecology, Gandhi Medical College and General Hospital.

Exclusion Criteria

- Abortion cases
- Ectopic Pregnancy
- Molar Pregnancy

Data Analysis

All patient profiles were recorded in proforma, and findings were tabulated; SPSS 24 was used to analyze the data.

Results : Out of 300 pregnant women,176(58%) in the age group of 21-25 years. 80.8% patients were asymptomatic. In symptomatic patients(19.2%) common presenting complaint was Dry cough(11.3%). Majority of the patients (78%)were diagnosed with RT-PCR, followed Rapid Antigen Test(20%). CT chest showing CORADS-V are used for diagnosis in 6% patients who are symptomatic and highly suspicious of COVID-19. Out of 300 patients 32 (10.6%)were admitted in intensive care unit. In 32 patients 20 were on oxygen support, 5 on non invasive ventilation and 7 on mechanical ventilation. 60 patients presented with comorbidities hypothyroidism being most common(40%) and overt diabetes least common (3%). Corticosteroids were given for 44 patients(14.6%), 12(4%) patients for fetal lung maturity and 32(10.6%) patients for maternal lung inflammation admitted in ICU. 207(69%) caesarean and 93(31%) vaginal deliveries. Previous caesarean section followed by fetal distress are the most common indications. 252(84%) term deliveries(>37weeks) and 48(16%)preterm

(<37weeks) deliveries. 32 patients were admitted in maternal intensive care unit(10.6%) and 7 maternal deaths, 3 Neonatal deaths and 2 Intrauterine fetal deaths were reported. Case fatality rate was 2.3% for pregnant women and 1% for neonates. Out of 298 alive babies, 9 were COVID-19 positive and 289 COVID-19 negative. None of these neonates had contact with infected mothers except during delivery, which suggests vertical transmission risk (3%).

Table 1: Age-wise Distribution of Patients.

Age – Years	Frequency	Percentage
15-20	28	9.3
21-25	176	58
26-30	82	8.6
31-35	10	3.3
36-40	4	1.3
Total	300	100

An examination of the data of Table 1 reveals that of the total 300 patients, a majority of 58% of them were in the age group of 21 and 25 years, remotely followed by the the age group of 15 to 20 years.

Table 2: Distribution of Patients based on presenting complaint.

Symptoms	Frequency	Percentage
Dry cough	34	11.3
Dyspnea	12	4
Fever	6	2
Diarrhea	4	1.3
Anosmia	2	0.6
Asymptomatic	242	80.8
Total	300	100

An analysis of Table 2 reveals that a great majority of 80.8% of the patients were asymptomatic while anosmia was reported by 0.6% only. Among the complaints, dry cough (11.3%) was most common followed by dyspnea (4%).

Modes of Diagnosis for COVID-19

Table 3: Distribution based on Modes of Diagnosis for COVID-19

Diagnosis	Frequency	Percentage
Rapid Antigen test	60	20
Rt-PCR	234	78
CTChest(Shielded) CORADS-V	6	2
Total	300	100

An analysis of Table 3 In the study of 300 patients, majority of the patients (78%)were diagnosed with RT-PCR, followed Rapid Antigen Test(20%).CT chest showing CORADS-V are used for diagnosis

in 6% patients who are symptomatic and highly suspicious of COVID-19.

Table 4: Distribution based on ICU admission.

	Frequency (n=32)	Percentage
Oxygen support	20	62.5
Non invasive ventilation(CPAP)	05	15.6
Mechanical Ventilatory Support	07	21.8
Total	32	100

An analysis of Table 4 : Out of 300 patients 32 (10.6%)were admitted in intensive care unit. In 32 patients 20 were on oxygen support, 5 on non invasive ventilation and 7 on mechanical ventilation.

Comorbidities

Table 5: Distribution based on Comorbidities.

Comorbidities	Frequency (n=60)	Percentage
Gestational hypertension	16	27
Preeclampsia	08	13
Imminent eclampsia	04	7
GDM	06	10
Overt DM	02	3
Hypothyroidism	24	40
Total	60	100

An analysis of Table 5: Out of 300 patients 60 had comorbidities hypothyroidism being most common (40)% Overt diabetes least common (3%).

Table 6: Distribution based on Drugs used.

	Frequency	Percentage
Anti virals (Oseltamivir)	30	10
Corticosteroids	44	14.6
1.For fetal lung maturity	12	4
2. For maternal lung inflammation	32	10.6

An analysis of Table 6: Out of 300 patients all patients were given antibiotics to prevent superimposed bacterial infection or as prophylaxis before caesarean section. Corticosteroids were given for 44 patients(14.6%),out of which 12(4%) patients for fetal lung maturity with gestational age<34weeks and 32(10.6%) patients for maternal lung inflammation admitted in ICU. Antivirals (Oseltamivir) was given to 30 (10%) patients.

Mode of Delivery

Table 7: Distribution based on Mode of delivery.

	Frequency	Percentage
LSCS	207	69
Vaginal delivery	93	31
Total	300	100

An analysis of Table 7: Caesarean section was most common mode of delivery(69%).Most common indication for caesarean section was 1previous caesarean 94(45.4%) followed by fetal distress 45(21.7%).

Type of Deliveries

Table 8: Distribution based on Type of deliveries.

	Frequency	Percentage
Preterm deliveries	48	16
Term deliveries	252	84
Total	300	100

An analysis of Table 8 : Out of 300 deliveries, 252 are term deliveries(>37weeks) and 48 preterm (<37weeks) deliveries.

Neonatal birth weight

Table 9: Distribution based on Neonatal birth weight.

Neonatal Birth Weight	Frequency	Percentage
<2kg	10	3.3
2.1-2.5	118	39
2.6-3.0	68	22.6
3.-3.5	96	32
>3.5	8	2.6
Total	300	100

Neonatal data

Table 10: Distribution based on the neonatal data.

	Frequency	Percentage
Live Babies(298)		
1.COVID-19 Positive	9	3
2.COVID-19 Negative	289	96.3
Intra Uterine Death	2	0.6
Total	300	100

An analysis of Table 10: Out of 300 deliveries 2 intra uterine deaths and 298 babies born alive were recorded. Of 298 live babies 289(96.3%) tested COVID-19 negative and 9(3%) tested as COVID-19 positive by RT-PCR. Of 9 COVID-19 positive babies 5 delivered by caesarean section and 4 by vaginal delivery.

Isolation of Neonates

Table 11: Distribution based on isolation of neonates.

	Frequency	Percentage
Neonates isolated from mother	289	96.3
Mother side	9	3
Total	298	100

An analysis of Table 11: Out of 298 alive babies COVID-19 positive neonates(3%) were given to the mother for breast feeding and COVID-19 negative neonates(96.3%) were isolated and given expressed breast milk or Formula feed.

Type of Neonatal Feeding

Table 12: Distribution based on Type of Neonatal Feeding.

	Frequency	Percentage
Breastfeeding	9	3.02
Expressed Breast milk	244	81.8
Formula Feed	45	15.1
Total	298	100

An analysis of Table 12: Breastfeeding given for 9 babies which are COVID-19 positive. Out of 289 COVID-19 negative babies 244 given expressed breast milk and 45 given Formula Feed.

Maternal Outcome

Table 13: Distribution based on Maternal Outcome.

	Frequency	Percentage
Maternal deaths	07	2.33%
Mothers discharged healthy	293	97.66%
Total	300	100

Perinatal Outcome

Table 14: Distribution based on Perinatal Outcome.

	Frequency	Percentage
Neonatal deaths		
1.Covid Positive	0	0
2.Covid Negative	3	1
Neonates discharged healthy	295	98.3
Intra Uterine Death	2	0.6
Total	300	100

An analysis of Table 14: Out of 300,298 live born babies, 2 intrauterine deaths,3 neonatal deaths reported in COVID-Negative babies .Two due to preterm acute respiratory distress syndrome. Third due to pneumothorax.

Discussion

We found that COVID-19 during pregnancy may be associated with severe maternal morbidity and the possibility of maternal-fetal transmission (3%).

The SARS-COV-1 outbreak during 2002-2003 has associated with a high maternal mortality rate (Case fatality rate of 25%)¹².

Similarly, Alfaraj et al¹³ reported a case series of 11 patients with MERS-CoV infection where the case fatality rate was 35% for pregnant women and 27% for infants. Compared to SARS-COV-1 and MERS, COVID-19 appears to be less lethal.

In this study out of 300 pregnant women 32 were admitted in maternal intensive care unit(10.6%) and 7 maternal deaths, 3 Neonatal deaths and 2 Intrauterine fetal deaths were reported. Case fatality rate was 2.3% for pregnant women and 1% for neonates. Women with tachypnea, hypoxia and more than 50% lung involvement on imaging must get admitted in critical care unit.

The most common presenting complaint was Dry cough (Non-Productive cough) whereas Dyspnea, Fever, and diarrhea were reported only occasionally.

Women with mild disease require general fluid electrolyte balance and symptomatic treatment along with close vigilant maternal vitals' surveillance. Monitoring for secondary bacterial infection and timely use of antibiotics when indicated.

With regard to Mode of delivery Caesarean section was performed in the majority of cases with previous caesarean section followed by fetal distress as the most common indications. Clinicians must weigh the continuation of the pregnancy against all the risks associated with premature birth that can lead to neonatal death. Mode of delivery should be on obstetric indication and not on presumed protection of baby against infection. In SARS-COV1 and MERS affected cases, delivery was most often indicated by maternal hypoxemia. In COVID-19, if maternal illness is not as severe, the considerations will be based more on obstetric indications for delivery.

Out of 298 babies, 9 reported as COVID-19 positive, they had no complications and were discharged healthy.

Out of 298 babies, 289 were COVID negative, of them 3 neonatal deaths. 2 died due to prematurity with respiratory distress and 1 due to Pneumothorax.

None of these neonates had contact with infected mothers except during delivery, which suggests the possibility of vertical or intrapartum transmission(3%). Therefore, we encourage to monitor the newborns of mothers with COVID-19 closely. Although breastfeeding is still encouraged, given the risk of neonatal morbidity from transmission through maternal exposure, the CDC recommends separation of mother and neonate. For women and infants who are separated, the CDC recommends that if a woman and newborn do room-in and the woman wishes to feed at breast, she should put on a mask and practice hand hygiene before each feeding. Discharge of the neonate and mother should be planned once both of them are stable.

Conclusion

The following conclusions were drawn from the study.

- Although the majority (97.66%) of mothers discharged without any significant complications. 10.6% of severe maternal morbidity(ICU admissions) as a result of COVID-19 and Case fatality rate was 2.3% for pregnant women and 1% for neonates. 295(98.3%) neonates discharged healthy.
- There is maternal-fetal transmission risk (3%) of SARS-COV-2.
- Careful monitoring of pregnancies with COVID-19 and measures to prevent neonatal infection was warranted.

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