International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2021; 5(5): 96-100
Received: 19-07-2021
Accepted: 21-08-2021

Khumanthem Pratima Devi
Assistant Professor, Department of Obstetrics and Gynecology, Regional Institute of Medical Sciences, Imphal, Manipur, India

Aheibam Bidya Devi
Senior Resident, Department of Obstetrics and Gynecology, Regional Institute of Medical Sciences, Imphal, Manipur, India

Moirangthem Rameswar Singh
Professor and Head, Department of Obstetrics and Gynecology, Regional Institute of Medical Sciences, Imphal, Manipur, India

Laiphrakpam Ranjit Singh
Professor, Department of Obstetrics and Gynecology, Regional Institute of Medical Sciences, Imphal, Manipur, India

S Dhivya Bharati
Postgraduate Trainee, Department of Obstetrics and Gynecology, Regional Institute of Medical Sciences, Imphal, Manipur, India

Corresponding Author:
Khumanthem Pratima Devi
Assistant Professor, Department of Obstetrics and Gynecology, Regional Institute of Medical Sciences, Imphal, Manipur, India

Obstetric and perinatal outcomes in the first wave of COVID-19 infected pregnant women

Khumanthem Pratima Devi, Aheibam Bidya Devi, Moirangthem Rameswar Singh, Laiphrakpam Ranjit Singh and S Dhivya Bharati

DOI: https://doi.org/10.33545/gynae.2021.v5.i5b.1024

Abstract
Objective: The COVID-19 pandemic continues to be a rapidly evolving situation with limited data on its impact on pregnancy. The study was conducted to evaluate the maternal and perinatal outcomes of pregnant women in the first wave of COVID-19 infection
Materials and Methods: Clinical records were retrospectively reviewed for 129 pregnant women with laboratory confirmed COVID-19 infection admitted in the Department of Obstetrics and Gynecology, Regional Institute of Medical Sciences, Imphal (Manipur, India) from 27th July to 27th November 2020. The maternal and perinatal outcomes were collected and analyzed. Evidence of perinatal transmission of the virus was assessed with SARS-Cov-2 Reverse transcriptase polymerase chain reaction testing done on oropharyngeal swab of neonate taken 24 to 48 hours after delivery.
Results: Of the 129 cases, 119 (92.24%) were asymptomatic and two (1.55%) had severe symptoms with one necessitating intensive care unit (ICU) admission and ventilatory support, subsequently causing maternal death. There were three cases (2.33%) of abortion, two ectopic pregnancies (1.55%) and ten preterm deliveries (8.54%). Two cases of neonatal asphyxia were observed, both requiring admission with one resulting in neonatal death. Furthermore, two out of 83 neonates were tested positive for COVID-19 on oropharyngeal swab.
Conclusion: Majority of the COVID-19 positive pregnant women were asymptomatic in the first wave and associated with good obstetric and perinatal outcome, however, severe case was associated with increased risk of ICU admission and mechanical ventilation ultimately leading to maternal death. Probable chances of vertical transmission of COVID-19 infection could not be ruled out at present.

Keywords: COVID-19, maternal morbidity, neonate, pregnancy, SARS-CoV-2

Introduction
The COVID-19 pandemic is a global public health emergency affecting 219 countries with India standing second position in the global tally [1]. The number of affected pregnant women has been increasing since its outbreak in December, 2019 at Wuhan city of China. Theoretically, pregnant women may be more susceptible to COVID-19 as they are at increased risk of acquiring viral respiratory infection and developing severe pneumonia due to the physiologic changes in their immune and cardiopulmonary system [2]. The previous two notable coronavirus outbreaks, the Severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) were more common and severe during pregnancy especially in the third trimester of pregnancy [2, 3]. However, pregnant women do not appear more likely to contract COVID-19 infection than the general population [4].
Reported cases of COVID-19 infection in pregnancy were asymptomatic or had only mild symptoms [5]. These women are at risk of infecting their newborns and pose a risk to healthcare providers and other patients. Considering this, ICMR recommends universal testing for SARS-CoV-2 in all pregnant women in/near labor who are admitted in the hospital for delivery [6]. Symptomatic pregnant women with COVID-19 are at increased risk of certain manifestation of severe illnesses like intensive care unit (ICU) admission and mechanical ventilation when compared with symptomatic non-pregnant peers [7]. Mortality rate was not increased in the reported cases of COVID-19 pregnant patients [7, 8].
There is paucity of data on the effect of COVID-19 in early pregnancy. There is no scientific evidence that COVID-19 increases the risk of fetal congenital malformations or causes miscarriage in early pregnancy and hence, is not an indication of medical termination of pregnancy (MTP) with the current scenario [9].

The Royal College of Obstetricians and Gynaecologists Guideline has reported some adverse outcome with COVID-19 in pregnancy in the form of slight increased risk of preterm delivery, premature rupture of membranes, maternal sepsis, preeclampsia and postpartum hemorrhage [4]. However, the available literature suggests that there is no substantial increased risk of acquiring COVID-19 in pregnancy or its increased virulence in pregnancy and labor and there are no adverse effects on fetus and neonate with negligible fetal transmission rate [10]. The study was undertaken to evaluate the effects of COVID-19 infection on maternal and perinatal outcomes and the matter is still evolving.

Materials and Methods

A retrospective observational study (chart review) was done based on the records of the secondary data obtained from the COVID-19 register of the Department of Obstetrics and Gynecology from 27th July to 27th November 2020 at Regional Institute of Medical Sciences, Imphal (Manipur, India). The first case of COVID-19 infected pregnant woman was detected on 27th July 2020 at the institute. The Institute is a dedicated COVID-19 referral hospital and on an average, approximately 10,000 non- covid deliveries (both vaginal delivery and cesarean section) are also conducted annually. Informed consents were taken from the patients for the study on admission. The study was approved by the Ethics Committee of the institute vide order no A/206/REB/Prop (Faculty) 144/71/2020.

Study population: All admitted COVID-19 positive cases detected by rapid antigen test (RAT as in ICMR) or Nucleic acid amplification test (TrueNat) or Reverse transcriptase polymerase chain reaction (RTPCR).

Inclusion criteria: Those antenatal patients admitted with COVID-19 infection only, irrespective of the period of gestation.

Exclusion criteria: Those COVID-19 positive patients who delivered outside and those who opted for home isolation before delivery. The COVID-19 positive cases during the study period were analysed retrospectively. Independent variables include age (in years), parity and maternal co-morbidities. Dependent variables include obstetric outcomes like mode of delivery, preterm delivery, intrauterine growth restriction (IUGR), intrauterine fetal death (IUD), postpartum haemorrhage (PPH), ICU admission, maternal death and perinatal outcomes include low birth weight (<2.5 kilogram, kg), Apgar score at 1 and 5 min, neonatal admission, early neonatal death, stillbirth and COVID-19 positive new born. Data was retrieved from the records using data abstraction form and checked for consistency and completeness before entering into IBM SPSS version 21.0 (IBM Corp., Armonk, NY, USA). Anonymity and confidentiality were maintained using password encryption. Statistical analysis: Continuous variables were expressed as means (standard deviation) or medians or simple ranges, as appropriate. Categorical variables were summarized as numbers and percentages.

Results

During the study period, 129 patients fulfilling the inclusion and exclusion criteria were analysed as shown in table 1. The maternal age ranged from 18 to 43 years with mean age of 29 years (±5.9 years). The gestational age on admission ranged from 5^{+6} to 42^{+6} weeks with median gestational age of 38 weeks. In view of extensive lockdown and closure of outpatient services, timely antenatal check-up could not be done and many patients presented beyond the expected date of delivery. Majority of the patients (58.02%) were multiparous. Most of the cases were asymptomatic (92.36%), only eight cases had mild symptoms like fever, cough and sore throat not requiring oxygen therapy. Two cases were reported to have severe symptoms. The first case was a 38-year-old, G5P3+0+1+2 with 36^{+5} weeks with gestational hypertension with low lying placenta with fever and cough for one day. Oral antibiotic (tablet azithromycin, 500mg) and antipyretics (tablet paracetamol, 500mg) were given. On third day of admission, she had shortness of breath and her oxygen saturation (SpO2) fell to 75% for which oxygen therapy and concomitant steroid therapy were started. The patient had bleeding per vagina (approximately 300ml of blood) on fifth day for which emergency cesarean section was done and a single dead female baby of 3.5 kg was delivered. Intra-operatively, liquor was thick meconium stained and around 200ml of retro placental clots were observed. Her condition improved in the post-operative period and was discharged on day 10 postpartum. The second case was a 39year old lady, G4P3+0+0+3 at 33^{+3} weeks, presented with cough and shortness of breath for four days. On arrival at triage room, her pulse rate was 110/min, respiratory rate 34/min and SpO2 38% at room air. She was immediately shifted to ICU and kept on non-invasive ventilation. Her chest X-ray showed bilateral opacities, 2D-ECHO was showing normal cardiac contractility and no thrombus in any cardiac chambers. On third day of admission, she was eventually intubated for mechanical ventilation due to worsening acute respiratory distress syndrome and she had cardiac arrest and expired on the same day. About 25 cases (29.38%) had associated co-morbidities like anemia, hypertensive disorders, subclinical hypothyroidism and heart disease.

Of the 129 pregnant women with COVID-19 infection, 117 cases (90.70%) delivered (107 at term, 10 preterm), 6 of them were continuing well with their pregnancy. Two cases had spontaneous abortion around 7 weeks gestation and another one at 18 weeks with anomalous baby for which termination of pregnancy was done. There were two cases of ectopic pregnancies and one case of maternal death as described earlier. Out of 117 delivered cases, all were singleton pregnancy except one case with twin pregnancy. It was also observed that the birth weight ranged from 1.3 kg to 4.5 kg with a mean birth weight of 3.1 kg (±0.5 kg). There were eleven neonates with birth weight less than 2.5 kg, 99 babies between 2.5 to 3.9 kg and eight cases of 4 kg or more.

As per institutional protocol, repeat testing for COVID-19 was done after seven to ten days of previous test by RTPCR. During the period of positivity, the patient was considered to be in active phase of COVID-19 infection while those tested negative on subsequent test were considered to be in recovering phase in the same admission setting. As shown in Table 2, 82 cases including one twin pregnancy delivered during active phase of COVID-19 infection while 35 cases delivered in the recovered phase. Most patients in active COVID-19 (63.41%) came in labour and delivered vaginally. However, overall cesarean section was high (51.28%), elective section was avoided as far as possible during active infection. Few cases of preterm delivery, IUGR, IUD and PPH were observed in the study.

There were five perinatal deaths including one early neonatal death as shown in table 3. Two neonates were admitted in neonatal ICU in view of prematurity with low Apgar score, of which one baby expired the next day of life. Only those 83

babies born during active COVID-19 infection were tested for COVID-19 on oropharyngeal swab taken 24 to 48 hours after delivery by RTPCR test. Of them, two were tested positive with one baby delivered vaginally and the other by cesarean section.

Table 1: Distribution of COVID-19 positive antenatal cases by demographics, baseline characteristics and pregnancy outcomes (N=129)

Parameters	N (%)
Age (Years)	
<20	4 (3.05)
20-25	41 (32.06)
26-29	28 (22.15)
30-34	34 (25.95)
≥35	22 (16.79)
Parity	
Nulliparous	54 (41.98)
Multiparous	75 (58.02)
POG (weeks) on admission	
<12	4 (3.10)
12-28	3 (2.32)
28-34	4 (3.10)
34-37	9 (6.98)
37-40	95 (73.65)
>40	14 (10.85)
Clinical presentation	
Asymptomatic	119 (92.36)
Mild symptomatic	8 (6.11)
Severe symptomatic	2 (1.53)
Co-morbidities	
Heart Disease	2 (1.56)
Subclinical Hypothyroidism	4 (3.10)
Hypertensive Disorders	8 (6.20)
Anaemia	11 (8.52)
Uncomplicated	104 (80.62)
Pregnancy outcome	
Delivered	117 (90.70)
Ongoing pregnancy	6 (4.65)
Abortion	3 (2.33)
Ectopic	2 (1.55)
Maternal death (undelivered)	1 (0.77)

Table 2: Obstetric outcomes of COVID-19 positive antenatal cases

Outcomes	Delivery during active covid-19 (n=82)	Delivery during recovered covid-19 (n=35)	All deliveries (n=117)
Mode of delivery Vaginal delivery Cesarean section	52 (63.41%) 30 (36.59%)	5 (14.29%) 30 (85.71%)	57 (48.72%) 60 (51.28%)
Preterm delivery (<37 weeks)	9	1	10 (8.54%)
IUGR	3	1	4 (3.41%)
IUD	2	0	2 (1.71%)
PPH	2	0	2 (1.71%)

Table 3: Neonatal outcomes of COVID-19 positive antenatal cases

Outcomes	Babies born during active covid-19 (n=83)	Babies born during recovered covid-19 (n=35)	Total newborn (n=118)
Low birth weight (<2.5kg)	8	3	11 (9.40%)
1 min Apgar score<7	8	0	8 (6.77%)
5 min Apgar score <7	6	0	6 (5.08%)
Neonatal Admission	2	0	2 (1.69%)
Early Neonatal Death	1	0	1 (0.84%)
Stillbirth	4	0	4 (3.38%)
COVID-19 RTPCR +ve	2	0	2

Discussion

Available literature shows many studies focussing on the impact of COVID-19 on general population; however, there is limited data on the outcomes of COVID-19 in pregnancy. As shown in Table 1, mean maternal age was 29 years (±5.9 years) and the median gestational age was 38 weeks. In a study by Yan *et al*. [11], the mean age was 30.8 (range 24-41) years and the median gestational age on admission was 38^{+0} weeks. Majority of the patients (92.4%) were asymptomatic and 19.38% of cases had associated co-morbidities in our study which is comparable to the study conducted by Nayak *et al*. where 97% of cases were asymptomatic or had mild symptoms and 19.14% of cases had comorbidities, the most common being anemia, pregnancy induced hypertension and eclampsia [12]. Based on the case series

by Yan *et al*. [11] and Breslin *et al*. [13], upto one-third of pregnant patients with COVID-19 were asymptomatic on admission. Yan *et al*. [11] also reported that 15.5% of cases had associated pregnancy complications like gestational diabetes mellitus, hypertensive disorders and preeclampsia. All patients recovered except one with maternal death who presented with severe symptoms making a case fatality rate of 0.77%. For India as a whole, the case fatality rate was one percent as on 5th February 2021 [1]. In a study conducted by Nayak *et al*. [12] the maternal mortality ratio of COVID-19 pregnancies was 2.12% which was slightly more than the one observed in the present study. There was no reported case of maternal mortality in a case series by Chen *et al*. [14]. Moreover, according to CDC COVID-19 surveillance [8] and ACOG Advisory on COVID-19 [7], no increase in the rate of mortality was observed in COVID-19 pregnant patients.

The majority of the cases had cesarean delivery accounting for a higher LSCS rate of 51.3% as shown in Table 2. In our study, LSCS was done for obstetric indications only. Similar to our study, higher cesarean rate was also observed in the study conducted by Nayak *et al*. (50%) [12], Yan *et al*. (86%) [11] and Yu *et al*. (100%) [15]. The rate of preterm birth was 21.2% in the case series of Yan *et al*. [11] and 26.3% in the study conducted by World Association of Perinatal Medicine (WAPM) Working group on COVID-19 [16]. Reported cases of IUGR, IUD and PPH occurred more commonly to those in active COVID-19 infection as compared to the recovered ones in the present study.

As shown in Table 3, there were four cases of stillbirth and one early neonatal death making a perinatal death rate of 4.2% which was comparable to that observed by WAPM Working Group on COVID-19 in its study [16] where six cases had stillbirth and five cases neonatal death with an overall perinatal death rate of 4.1%. However, in the study of Yan *et al*. [11], there was no stillbirth but one case of severe neonatal asphyxia resulting in neonatal death accounting for a perinatal death rate of one percent.

Out of those 85 babies who were tested for COVID-19 infection in the first wave, two new-born babies were found to be positive on oropharyngeal swab by RTPCR. In a case series by Yu *et al*. [15] on seven cases, three neonates were tested for SARS-CoV-2 and a neonate was tested positive in the oropharyngeal swab by RTPCR. Vertical transmission was not seen in the study conducted by Chen *et al*. [14] and Lei *et al*. [17]. It was also observed in the present study that neonatal complications like low birth weight, low Apgar score, stillbirths and early neonatal death were higher in babies born during active maternal COVID-19 infection as compared to ones delivered during recovered phase.

Limitation: The limitation of the study was lack of internal control and provision of testing of amniotic fluid and placenta.

In conclusion, most of the COVID-19 infected pregnant women were asymptomatic and even if symptomatic, had mild disease with good recovery. Obstetric and perinatal outcomes appeared to be good. Delivery during active maternal COVID-19 infection was associated with poor neonatal outcomes compared with delivery after recovery. Probable chances of vertical transmission of the disease could not be ruled out. Large scale studies with good quality data are needed to draw an unbiased conclusion.

Declaration of conflicting interest: None

Funding: None

References

1. Coronavirus Update (Live): 105,427,753 Cases and 2,294,710 Deaths from COVID-19 Coronavirus Pandemic-Worldometer 2021. Available at https://www.worldometers.info/coronavirus/#countries. Accessed February 5, 2021
2. Jamieson DJ, Honein MA, Rasmussen SA, Williams JL, Swerdlow DL, Biggerstaff MS *et al*. H1N1 2009 influenza virus infection during pregnancy in the USA. Lancet 2009;374:451-58.
3. Al-Tawfiq JA. Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and COVID-19 infection during pregnancy. Travel Med Infect Dis 2020;36:101641.
4. Royal College of Obstetricians & Gynaecologists. Coronavirus (COVID-19) infection in pregnancy. Available at https://www.rcog.org.uk/globalassets/documents/guidelines/2020-10-14-coronavirus-covid-19-infection-in-pregnancy-v12.pdf. Accessed February 5, 2021
5. ICMR, NIRRH. Guidance for Management of Pregnant Women in COVID-19 Pandemic. Indian Council of Medical Research, National Institute for Research in Reproductive Health 2020. Available at https://www.icmr.gov.in/pdf/COVID/techdoc/Guidance_for_Management_of_Pregnant_Women_in_COVID19_Pandemic_12042020.pdf. Accessed February 5, 2021
6. ICMR. Advisory on Strategy for COVID-19 Testing in India (Version VI, September 2020). Indian Council of Medical Research 2020. Available at https://www.icmr.gov.in/pdf/covid/strategy/Testing_Strategy_v6_04092020.pdf. Accessed February 5, 2021
7. The American College of Obstetricians and Gynecologists. Novel Coronavirus 2019 (COVID-19). Available at https://www.acog.org/en/Clinical/Clinical%20Guidance/Practice%20Advisory/Articles/2020/03/Novel%20Coronavirus%202019. Accessed February 5, 2021
8. Centers for Disease Control and Prevention. Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19). Available at https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html. Accessed February 5, 2021
9. Khoiwal K, Kapur D, Gaurav A, Chaturvedi J. Management of Pregnant Women in Times of COVID-19: A Review of Current Literature. J Obstet Gynecol India 2020;70:262-66.
10. Sharma JB, Sharma E, Sharma S, Singh J. Recommendations for prenatal, intrapartum, and postpartum care during COVID-19 pandemic in India. Am J Reprod Immunol 2020;84:e13336. https://doi.org/10.1111/aji.13336
11. Yan J, Guo J, Fan C, Juan J, Yu X, Li J *et al*. Coronavirus disease 2019 (COVID-19) in pregnancy women: A report based on 116 cases. Am J Obstet Gynecol 2020;223(1):111.e1-111.e14. Doi: 10.1016/j.ajog.2020.04.014.
12. Nayak AH, Kapote DS, Fonseca M *et al*. Impact of the coronavirus infection in pregnancy: a preliminary study of 141 patients. J Obstet Gynecol India 2020;70:256-61.
13. Breslin N, Baptiste C, Gyamfi-Bannerman C, Miller R, Martinez R, Bernstein K *et al*. COVID-19 infection among asymptomatic and symptomatic pregnant women: Two weeks of confirmed presentations to an affiliated pair of New York City hospitals. Am J Obstet Gynecol MFM 2020, 100118.
14. Chen H, Guo J, Wang C, Luo F, Yu X, Zhang W *et al*.

Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. Lancet 2020;395(10226):809-815. Doi: 10.1016/S0140-6736(20)30360-3.
15. Yu N, Li W, Kang Q, Xiong Z, Wang S, Lin X *et al*. Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study. Lancet Infect Dis 2020;20(5):559-64.
16. WAPM (World Association of Perinatal Medicine) Working Group on COVID-19. Maternal and perinatal outcomes of pregnant women with SARS-CoV-2 infection. Ultrasound Obstet Gynecol 2021;57(2):232-41.
17. Lei D, Wang C, Li C, Fang C, Yang W, Cheng B *et al*. Clinical characteristics of COVID-19 in pregnancy: analysis of nine cases. Chin J Perinat Med 2020;23:225-31.