

Clinical Profile and Outcome of Corona Virus Disease-19 Infection in Pregnant Women

Kirtipal Subedi,¹ Prajwal Paudel,¹ Amitabh Thakur,¹ Sandesh Poudel,¹ Poonam Sharma,² Shree Prasad Adhikari¹

ABSTRACT

Background: The corona virus disease 19 pandemic has affected the whole world with pregnant ladies being more vulnerable population. This study aimed to evaluate characteristics of corona virus disease 19 infection in pregnancy and neonates and whether close proximity to the mother increases the incidence of corona virus disease infection in neonates.

Methods: This is a hospital based prospective cross sectional observational study done among pregnant women presenting to Paropakar maternity and womens hospital from 1st September 2020 to 31st march 2021 with confirmed corona virus disease 19 infection.

Results: The total 160 cases were included in study. Most of the women (33.8%) were of 20- 25 years of age, 55 % were multigravida and 77.6 % were full term. Around 74 % of cases were symptomatic with predominant symptoms being cough, fever and sore throat present in 33.1 %, 18% and 14% respectively. Out of 125 deliveries 71 % of cases underwent cesarean section of which fetal distress was most common indication. Six newborns were positive for corona virus disease 19 infection within 48 hours of life. Mortality was seen in four mothers and three neonates.

Conclusions: The clinical presentation of corona virus disease infection in pregnant ladies is similar to general population. There is no increased risk of vertical transmission to the baby.

Keywords: corona virus disease 19; pregnancy outcome; vertical transmission.

INTRODUCTION

COVID 19 has gripped the world since its identification at the end of December 2019, in the Wuhan, China and was declared a pandemic in 11 March 2020 by World health organization due to its impact in the health of people throughout the world. Till date the disease has infected more than 25,000,000 people causing approximately 850,000 deaths.¹ Being a novel virus its effect and pathogenesis is still unclear but has shown to increase mortality in older population and those with preexisting medical diseases.²

Pregnant women are particularly vulnerable with partial state of immunosuppression and increased risk of infection also due to mandatory frequent visits to the hospital for routine antenatal examinations.³ Most studies have shown similar infectivity and morbidity in pregnant women as the general population with viral pneumonia being the leading cause of mortality.⁴ However there is paucity in literature regarding its effect on pregnant ladies, outcome of pregnancy and

the new born child in Nepali population. Hence this study is conducted in Paropakar Maternity and Women's hospital to look at the clinical features and outcome of pregnancy.

METHODS

A prospective observational study was conducted in Paropakar Maternity and Women's Hospital (PMWH) for a period of seven months from 1st September 2020 to 31st March 2021.. This is the largest government tertiary hospital of Nepal located in Kathmandu which conducts over 22,000 deliveries in a year. During the COVID pandemic a new COVID wing was developed further from the main hospital premises to avoid contact with non COVID cases. It received all the referral pregnant women in and around Kathmandu valley.

Ethical approval was taken from the Institutional Review committee of Paropakar Maternity and Women Hospital.

The protocol for doing RT PCR for COVID 19 in this

Correspondence: Dr Kirtipal Subedi, Paropakar Maternity and Women's Hospital, Thapathali, Kathmandu, Nepal. Email: kirtipalsubedi@gmail.com, Phone: +9779851097158.

hospital was presence of signs and symptoms suspicious of COVID 19 infection. Patients having fever, cough, headache, shortness of breath, sore throat or diarrhoea underwent RT PCR testing for COVID 19. All pregnant women visiting PMWH with RT PCR COVID 19 positive were included in the study. Patients who underwent RT PCR for COVID 19 in other institutes as a routine investigation before intervention and were referred to PMWH when found to be positive for COVID 19 were also included in the study. Pregnant women with symptoms and signs suspicious of COVID 19 infection but on RT PCR report negative were excluded from the study.

Demographic profile and other details were recorded in pre designed proforma after taking informed consent from each patient. Details such as age, address, parity and gestational age was recorded. The presenting predominant symptom in symptomatic individuals was taken as the presenting symptom.

Patients requiring delivery were managed by vaginal delivery or LSCS if indicated whereas those cases where delivery was not eminent were managed conservatively. Manual vacuum aspiration was done for incomplete abortion and emergency laparotomy was done for ruptured ectopic pregnancy. Patients who had facilities at home for isolation were sent home after resolution of their symptoms whereas those who could not manage isolation at home stayed in the hospital isolation for 14 days since the RT PCR for COVID 19 was positive.

Other clinical parameters of mother such as mode of delivery, indication for lower segment caesarean section (LSCS) and outcome of mother were recorded. Clinical parameters of baby including gestational age, PCR status of the baby, outcome of baby and breast feeding was noted. RT PCR for COVID 19 of the baby was sent as early as possible all within 48 hours of birth. Immediate neonatal outcome and status of the mother were recorded along with their status after six months by following them over the phone.

All the data were analyzed by SPSS software.

RESULTS

A total of 194 pregnant women visited PMWH with COVID 19 PCR positive status during the study period, out of which 160 cases were included in the study. Remaining 34 cases were excluded as cases couldn't be contacted during follow up. Table 1 shows the various demographic parameters of these women. The mean age of the patients was 27.14 ± 5 with minimum 14 and

maximum 42 years of age. Similarly most of the women were multigravida mostly being Gravida 2-3. Also the mean gestational age of pregnancy was 35.0 ± 8.7 weeks with minimum gestational age being five weeks and maximum of 42 weeks.

Table 1. Demographic profile.

Demographic Parameters	Number	Percentage
Age in years		
<20	14	8.8
20-25	54	33.8
25-30	49	30.6
30-35	37	23.1
>35	6	3.8
Parity		
Primigravida	72	45.0
2-3	76	47.5
4-5	10	6.2
more than 5	2	1.2
Gestational Age in weeks		
<22	18	11.3
22-29.9	6	3.8
30-36.9	18	11.3
37-39.9	105	65.6
>40	13	8.1
Total	160	100.0

Similarly 74% of patients were symptomatic while PCR was done as a screening tool preprocedure in 26% of women. Patients most frequently complained of cough being the prominent symptom, present in 33% while fever was present in 18%.

Table 2. Diagnosis of Corona virus disease-19 infection.

Parameters	Number	Percent
Reason for PCR		
routine	42	26.3
symptomatic	118	73.8
Total	160	100.0
Predominant Symptom		
Anosmia	7	5.9
Cough	39	33.1
Diarrhea	10	8.5
Fever	21	17.8
Myalgia	15	12.7
Shortness of breath	9	7.6
Sore throat	17	14.4
Total	118	100.0

Table number 3 shows the outcome of pregnancy and indication for LSCS done. One patient had ectopic pregnancy requiring emergency laparotomy and 25 patients had conservative and symptomatic management of COVID 19 symptoms while the pregnancy was continued. Termination of pregnancy was done in 84% of cases by various modalities as shown in the table 3. Fetal distress was the most common indication for LSCS present in 31% of cases.

Table 3. Pregnancy outcome.

Management in hospital	Number	Percentage
Outcome of pregnancy		
Emergency Laparotomy	1	0.6
Manual Vacuum Aspiration	9	5.6
Vaginal delivery	54	33.8
Cesarean section	71	44.4
Conservative management	25	15.6
Total	160	100.0
Indication for Cesarean Section		
Fetal distress	22	31.0
Twin with PROM	2	2.8
Oligohydramnios	9	12.7
Non progress of labour	8	11.3
Previous CS in labour	19	26.8
Severe Pre-eclampsia	5	7.0
Decreased fetal movement	2	2.8
Chorioamnionitis	1	1.4
Bad obstetrics history	1	1.4
Antepartum hemorrhage	1	1.4
Failed induction of labour	1	1.4
Total	71	100.0

There were four maternal mortality among the COVID 19 infected pregnant mothers, two being immediate death due to COVID pneumonia and two after being referred to multidisciplinary center. Ninety Six percent of the women could be discharged home from our center while six patient required referral to multidisciplinary center for comprehensive care.

Table 4. Maternal outcome.

Outcome	Number	Percentage
Immediate outcome		
Discharged after hospital isolation	41	25.6%
Discharged on home isolation	107	66.8%

ICU admission	4	2.5%
Referred for multidisciplinary care	6	3.7%
Death	2	1.2%
Total	160	
Late Outcome		
Death	2	1.2%
Healthy	156	98.7%

The mean gestational age at birth was 38.3 ± 2.6 weeks with minimum age being 23 weeks and maximum being 42 weeks. One pregnancy was twin pregnancy resulting in 126 babies born to COVID positive mothers. Most of the babies were born at term with 12% being preterm. Among 126 babies, 13 (10.3%) babies had to be transferred to NICU/nursery for additional care while the rest were healthy. Similarly 96 (76.1%) babies were given immediately to the mother while the rest were separated from the mother either due to neonatal or maternal complication. Ten babies were separated from the mother on their request due to maternal anxiety of transmission of infection to the neonate. Breastfeeding was done in 106 (84.1%) babies.

Table 5. Neonatal Outcome.

	Number of patients	Percentage
Gestational age at delivery		
Preterm	15	12
Term	97	77.6
Post dated	13	10.4
PCR for COVID 19		
Positive	6	4.8
Negative	120	95.2
Total	126	100
Immediate Outcome		
Motherside	99	78.5
NICU/Nursery	20	15.8
Ventilator	4	3.1
Death	3	2.3
Total	126	100

DISCUSSION

Since the beginning of the year 2020 the entire world has been clutched by the new virus which originated from Wuhan province of China. New data about this new disease

are accumulating increasing our understanding about the epidemiology, pathogenesis and clinical features which help to make guidelines for the management and decrease its impact. However the clinical features and the effect of COVID 19 in pregnant women and neonates is still uncertain. Previous infections of severe acute respiratory syndrome and Middle East respiratory syndrome are known to have severe impact in perinatal outcome which is complicated with abortions, preterm delivery, intrauterine growth retardation and mortality.⁵ Pregnant women are more susceptible to infection owing to their relative immunodeficiency state and changes in the cardiopulmonary physiology.

In a study done among 43 pregnant women, the mean gestation age of delivery was 37 weeks among whom mild form of illness was seen in 86% of women while 9.3% had severe disease and 4.7% had critical form of respiratory distress similar to our study where the mean gestational age was 38 weeks.⁶ Reports have also suggested high incidence of cesarean section usually before term in infected pregnant women.² However few cases reports in China have shown that vaginal delivery to be successful with no complication.⁷ Lower segment cesarean section (LSCS) was the most common mode of delivery done in 57% of cases while the rest had vaginal delivery. The percentage of LSCS in this study although is high but it remains consistent with the increased incidence of LSCS in COVID 19 positive status around the world.⁸⁻¹¹ Moreover in this study the indication of performing LSCS was always obstetrical rather than due to the effects of corona virus.

Studies have shown fever to be the most common symptom followed by cough seen in 72% and 62% respectively.¹² Similarly among neonates with COVID 19 infection, the most common infection was respiratory distress followed by gastrointestinal symptoms, fever, tachycardia and vomiting.¹³ Fever was found to be the most common symptom in pregnant women followed by cough.⁸ Zaigham et al reported fever to be present in 68% and cough 34% of pregnant women with corona virus infection.¹⁴ In consistent to other reports, our study also recorded cough as the most common predominant symptom present in 33 % followed by fever, sore throat and myalgia.^{8,15} Gastrointestinal symptoms were also common with diarrhea being present in 10 patients. In a meta analysis, preterm delivery was present in 32.1% all occurring before 34 weeks of gestation and perinatal death was seen in 33.2%.¹²

Delivery of babies at full term was present in most of the cases with preterm delivery present only in 12%

of cases. However studies have shown an increase in the number of preterm deliveries in mothers infected with COVID 19.¹⁶ The cause of preterm delivery is not known in most of the studies. Most of the babies (90%) in our study were born healthy and could be immediately transferred to mother side which is similar to many studies reported.¹⁷ Previous studies on SAR-S infection have demonstrated that there is no vertical transmission of influenza virus however higher incidence of preterm delivery, spontaneous abortion and intrauterine growth retardation have been reported.^{18,19} This is a single center study done only for a short period of seven months. Also the number of cases is small which the major limitation of this study.

CONCLUSIONS

The clinical presentation of pregnant women seems to be similar to non-pregnant adults with no increase in risk of mortality than general population. Similarly there is no data to support vertical transmission of COVID 19 infection to the baby. This study has aimed to summarize the maternal and fetal outcome on COVID 19 infected pregnant women. We recommend more detail research regarding the laboratory findings and outcome in sick pregnant women and babies infected with COVID 19 in the future.

Author Affiliations

¹Paropakar maternity and womens hospital, Thapathali, Kathmandu, Nepal

²Shahid Gangalal National Heart Centre, Bansbari, Kathmandu, Nepal

Competing interests: None declared

REFERENCES

1. WHO Coronavirus Disease (COVID-19) Dashboard [Internet]. [cited 2020 Sep 3]. Available from: https://covid19.who.int/?gclid=Cj0KCQjwhb36BRCfARIsAKcXh6F-RiWr2bDg5TPpskyxbEHDbuTvwqeQtrKNLdZjrHhbehseyC3e5kaAhgBEALw_wcB
2. Della Gatta AN, Rizzo R, Pilu G, Simonazzi G. Coronavirus disease 2019 during pregnancy: a systematic review of reported cases. *Am J Obstet Gynecol.* 2020;223(1):36–41.[Article]
3. Dangal G. COVID-19 in pregnancy: Pregnant women might be at greater risk for severe COVID-19. Vol. 18, Kathmandu University Medical Journal. Kathmandu University; 2020 p. 1–2.[Article]
4. Akhtar H, Patel C, Abuelgasim E, Harky A. COVID-19

- (SARS-CoV-2) Infection in Pregnancy: A Systematic Review. *Gynecol Obstet Invest.* 2020;85(4):295-306. [\[Article\]](#)
5. Freitas-Jesus JV, Rodrigues L, Surita FG. The experience of women infected by the COVID-19 during pregnancy in Brazil: A qualitative study protocol. *Reprod Health.* 2020;17(1):1–7. [\[Article\]](#)
 6. Farrell R, Michie M, Pope R. Pregnant Women in Trials of Covid-19: A Critical Time to Consider Ethical Frameworks of Inclusion in Clinical Trials. *Ethics Hum Res.* 2020;42(4):17–23. [\[Article\]](#)
 7. Khan S, Peng L, Siddique R, Nabi G, Nawsherwan, Xue M, et al. Impact of COVID-19 infection on pregnancy outcomes and the risk of maternal-to-neonatal intrapartum transmission of COVID-19 during natural birth. *Infect Control Hosp Epidemiol.* 2020;41(6):748–50. [\[Article\]](#)
 8. Wang CL, Liu YY, Wu CH, Wang CY, Wang CH, Long CY. Impact of covid-19 on pregnancy. *Int J Med Sci.* 2021;18(3):763–7. [\[Article\]](#)
 9. 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 (London, England).* 2020 Mar 7;395(10226):809–15. [\[Article\]](#)
 10. 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. [\[Article\]](#)
 11. Fan C, Lei D, Fang C, Li C, Wang M, Liu Y, et al. Perinatal Transmission of COVID-19 Associated SARS-CoV-2: Should We Worry? *Clin Infect Dis [Internet].* 2021;72(5):862–4. [\[PubMed\]](#)
 12. Arshad S, Raza S, Javed I. Effects of COVID-19 infection during pregnancy and neonatal prognosis: What is the evidence? *Int J Environ Res Public Health* 2020;17(11):1–17. [\[Article\]](#) [\[DOI\]](#)
 13. Zhu H, Wang L, Fang C, Peng S, Zhang L, Chang G, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. *Transl Pediatr.* 2020;9(1):51–60. [\[PubMed\]](#)
 14. Zaigham M, Andersson O. Maternal and perinatal outcomes with COVID-19: A systematic review of 108 pregnancies. *Acta Obstet Gynecol Scand.* 2020;99(7):823–9. [\[Article\]](#)
 15. Arakaki T, Hasegawa J, Sekizawa A, Ikeda T, Ishiwata I, Kinoshita K, et al. Clinical characteristics of pregnant women with COVID-19 in Japan: a nationwide questionnaire survey. *BMC Pregnancy Childbirth.* 2021;21(1):1–8. [\[Article\]](#)
 16. Mullins E, Evans D, Viner RM, O'Brien P, Morris E. Coronavirus in pregnancy and delivery: rapid review. *Ultrasound Obstet Gynecol.* 2020;55(5):586–92. [\[Download PDF\]](#)
 17. Akhtar H, Patel C, Abuelgasim E, Harky A. COVID-19 (SARS-CoV-2) Infection in Pregnancy: A Systematic Review. *Gynecol Obstet Invest.* 2020;85(4):295–306. [\[Article\]](#)
 18. Shek CC, Ng PC, Fung GPG, Cheng FWT, Chan PKS, Peiris MJS, et al. Infants born to mothers with severe acute respiratory syndrome. *Pediatrics.* 2003;112(4). [\[Article\]](#)
 19. Wong SF, Chow KM, Leung TN, Ng WF, Ng TK, Shek CC, et al. Pregnancy and perinatal outcomes of women with severe acute respiratory syndrome. *Am J Obstet Gynecol.* 2004;191(1):292–7. [\[Article\]](#)