

ORIGINAL ARTICLE

Perinatal Outcome in Covid-19 Positive Patients at Obstetrics & Gynecological UnitSAIRA MUSHTAQ¹, AMBER SHAMI², WAQAS QARSHI³, MALEEHA TAHIR BUTT⁴, ZARRIN KHALIQ CHAUDARI⁵, SABA TAHIR⁶¹Associate Professor, Department of Biochemistry, Aziz Fatimah Medical and Dental College, Faisalabad, Pakistan²Assistant Professor, Department of Anatomy, Central Park Medical College, Lahore, Pakistan³Assistant Professor, Department of Physiology, Abwa medical college, Faisalabad, Pakistan⁴Assistant Professor, Department of Biochemistry, Abwa medical college, Faisalabad, Pakistan⁵Assistant Professor, Department of Biochemistry, Abwa medical college, Faisalabad, Pakistan⁶Senior Demonstrator, Department of Biochemistry, Abwa medical college, Faisalabad, PakistanCorrespondence to: Maleeha Tahir Butt, Email: maleehatahirbutt@gmail.com**ABSTRACT****Aim:** To determine the frequency of perinatal outcomes in COVID-19 positive patients at obstetric and gynecological unit.**Material and methods:** An observational cross sectional study was conducted at Aziz Fatimah medical college, Obstetrics and Gynecology department from January 2021 to June 2021 on 100 pregnant COVID positive patients. Perinatal outcomes such as cesarean section, postpartum hemorrhage, preterm birth and NICU admissions were assessed. Data was presented as frequencies, percentages and Mean±SD.**Results:** Mean maternal age was 29.71±6.05 years. The mean gestational age was 36.47±3.83 weeks. Postpartum hemorrhage was seen in 11 (11%) patients, Preterm birth rate was 37 (37%), NICU admissions rate was 44 (44%) and 54 (54%) patients had cesarean section.**Conclusion:** Pregnant COVID 19 positive women are at great risk of having perinatal complication.**Keywords:** COVID-19, Perinatal outcomes, Pregnancy**INTRODUCTION**

The scientific community has to react quickly to the coronavirus disease 2019 (COVID-19) pandemic outbreak. Since about July 30, 2020, there were frighteningly over 667,000 casualties from documented infections, which comprised over 17 million cases¹. As a result, research facilities around the world have consolidated efforts to identify therapeutic potential approaches, predict future pandemic progression trends, and describe the most vulnerable individuals from existing data in order to prepare patient-specific measures². The fact that the disease vigorously spread throughout the world results in worst case scenario³.

During a study involving pregnant women, it was observed that COVID-19 was linked to both premature delivery and NICU admission⁴. Other significant perinatal outcomes, however, could not be evaluated due to a lack of data, and the various researches contains some trials where COVID-19 was determined based exclusively on clinical suspicion and without testing⁵.

It is not surprising that viral infections may influence pregnancy outcomes because pregnancy is a state that is especially susceptible to infectious diseases⁶. Earlier studies has discovered that viral respiratory illnesses may increase the risk of complications during pregnancy and adverse perinatal outcomes, predominantly due to changes in the immune response⁷.

Moreover, research from the past on the Zika virus suggests that infectious disorders may aggravate concerns or possibly have catastrophic impacts on pregnant women^{8,9}. Given the gravity of the situation, it is clear that many research teams have been extensively investigating the impact of COVID-19 in pregnant women as a result of this acknowledgment^{10,11}.

In a study, pregnant patients giving birth at a single academic facility, reported no association between COVID-19 and poor perinatal outcome of preterm birth, severe preeclampsia, or caesarean delivery. Though 95% of the sample had asymptomatic or moderate disease, it is still uncertain whether prenatal outcomes vary based on the extent of the COVID-19¹².

The COVID-19 raises the chance of catastrophic illness in pregnant or recently pregnant women, while having the lowest overall risk for pregnant women. The need for hospitalization, intensive care, or the use of a ventilator to assist with breathing may result from severe illness. As prenatal outcomes in this condition are not always positive, we started an investigation of perinatal outcomes in patients who tested positive for covid-19 at the gynecological and obstetrics unit of the Hospital.

MATERIAL AND METHODS

This observational cross sectional study was conducted at Aziz Fatimah medical college, department of Obstetrics and Gynecology from January 2021 to June 2021. After taking ethical approval from the hospital 100 pregnant COVID 19 positive patients were enrolled for the study from hospital's Gynecology OPD. Nasal swabs were collected from all patients for Polymerase chain reaction (PCR) test for confirmation of COVID 19. Informed written consent was taken from all patients. All the patients were examined clinically and history was taken. Patients in the age range of 18 to 40 years were included. Patients having history of lung, cardiac and renal diseases were excluded. All the demographic data was recorded on a predesigned pro-forma. All the deliveries were performed by an experienced obstetrician. The neonates were physically assessed by an experienced pediatrician. Perinatal outcomes such as postpartum hemorrhage, cesarean section, preterm birth and NICU admission were recorded.

The sample size was calculated using open epi by taking the previous anticipated frequency of post-partum hemorrhage 14.9%¹³, margin of error 7% and confidence interval 95%, the estimated sample size was 100.

Data was analyzed using IBM SPSS 20. Categorical variables were presented as frequencies and percentages and numerical variables were presented as mean and SD.

RESULTS

This study was conducted on 100 pregnant COVID 19 infected women. The mean age of the patients was 29.71±6.05 years. The mean gestational age was 36.47±3.83 weeks and the mean BMI calculated was 28.57±3.45 Kg/m². According to the perinatal outcomes, 54 (54%) patients had cesarean section. Postpartum hemorrhage was observed in 11 (11%) patients. Preterm birth rate was 37 (37%) and NICU admissions rate was 44 (44%). Diabetes was diagnosed in 4 out 100 patients. Preeclampsia was diagnosed in 15 (15%) patients. Regarding the birth weight of the neonates, 30% of the neonates had < 2.5 kg weight, 54% had weight between 2.5 to 4 kg and 16% neonates had weight > 4 kg.

Table 1: Demographics

Demographics	Statistics
Age (years)	29.71±6.05
Gestational age (Weeks)	36.47±3.83
BMI (Kg/m ²)	28.57±3.45
Parity	1 to 3
	>3
	38 (38%)
	62 (62%)

Table 2: Perinatal Outcomes (n = 100)

Perinatal outcomes		Statistics
Mode of delivery	Normal vaginal delivery	46 (46%)
	Cesarean section	54 (54%)
Postpartum hemorrhage		11 (11%)
Preterm birth		37 (37%)
NICU admissions		44 (44%)

DISCUSSION

The effects of COVID-19 on the high - risk population, especially pregnant women, are extremely worrying because changes to cell-mediated immunity during pregnancy may make individuals more susceptible to viruses and other intracellular infections¹⁴. The maternal tolerance to hypoxia may be reduced as a result of the morphological and physiological changes that take place during pregnancy, including the increasing transverse diameter of the thorax, elevation of the diaphragm, changes in respiratory pattern, and widening of blood vessels with subsequent mucosal swelling¹⁵. Additionally, it has been noted that the severity of the condition's expression worsens in the pregnant women during pandemics. Deaths was found to be 27% among individuals impacted by the 1918 influenza epidemic. In contrast to non-pregnant women, the clinical outcomes of the two prior coronavirus illnesses, SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV), have been less favorable in pregnant women.¹⁶

The increased risk of maternal and fetal complications with COVID-19 has been a major concern due to previously reported maternal and neonatal complications with SARs and MERS. Since the start of the pandemic, numerous studies have concentrated on the clinical characteristics and findings of pregnant women with COVID-19¹⁷. Every day, more information about COVID-19-affected pregnant women becomes available, but it is crucial to compare the risk factors, treatments, and pregnancy and perinatal findings amongst pregnant women with diverse clinical manifestations and laboratory-confirmed coronavirus infections.¹⁸

Our study was conducted on 100 pregnant women diagnosed with COVID 19. We reported findings of their perinatal outcomes. In our study the mean age of the patients was 29.22±4.31 years having range from 18 to 40 years. A study¹⁹ conducted in Pakistan reported that the mean maternal age of pregnant women infected with COVID 19 was 28.94. In our study term gestation was from 37 to 41 weeks and preterm gestation period was < 37 weeks. Similar characteristics were observed in the aforementioned study.

Regarding the perinatal outcomes, in our study cesarean section was performed on 54% of the patients. A Pakistani study¹⁹ reported that 59% of their patients had cesarean section. In another study¹³ the frequency of cesarean section was 59.6% in COVID 19 positive pregnant women. Preterm and term C-sections are performed due to concerns that excessive ventilation and stress during labor might the respiratory and pro-inflammatory status accompanying COVID-19. The major concerns associated with COVID-19 positive pregnant women is that excessive ventilation and stress during ongoing labor may exacerbate the pro-inflammatory status and respiration of the patient²⁰.

In our study the frequency of postpartum hemorrhage was 11%. We defined the postpartum hemorrhage as blood loss of more than 1000 ml. A study¹³ reported 14.9% postpartum hemorrhage in critical and severe COVID 19 patients and 9% postpartum hemorrhage in mild cases. These reports are in comparison with our findings.

Our results showed that the frequency of preterm birth was 37%, we defined preterm birth as <37 weeks of gestation. A study reported¹³ 41.8% preterm birth rate in their findings which in again comparable to our study. Several studies have reported higher rates of preterm births in COVID 19 patients.^{20,21}

In our study the frequency of NICU admission was 44%. A study²³ reported 47.06% of NICU admission in their findings. Nearly one-third of newborns were admitted to the NICU, according to a systematic evaluation of clinical outcomes of 211

PCR-confirmed and 84 clinically diagnosed instances of pregnant women with COVID19.

CONCLUSION

From our study we conclude that pregnant women who have contracted COVID 19 infection are at higher risk of developing perinatal complications. Obstetricians need to be well prepared and be aware of these complications.

REFERENCES

- Hopkins J. University of Medicine. Coronavirus Resource Center. Data Stream. 2020.
- Rosenthal DM, Ucci M, Heys M, Hayward A, Lakhanpaul M. Impacts of COVID-19 on vulnerable children in temporary accommodation in the UK. *Lancet Glob Health*. 2020;5(5):241-42.
- Molloy EJ, Bearer CF. COVID-19 in children and altered inflammatory responses. *Pediatr Res*. 2020;88(3):340-41.
- Gardner W, States D, Bagley N. The coronavirus and the risks to the elderly in long-term care. *J Aging Soc Policy*. 2020; 32(4-5):310-5.
- Brake SJ, Barnsley K, Lu W, McAlinden KD, Eapen MS, Sohal SS. Smoking upregulates angiotensin-converting enzyme-2 receptor: a potential adhesion site for novel coronavirus SARS-CoV-2. *J Clin Med*. 2020; 9(3):841-49.
- Hemorrhage P. Practice bulletin no. 183. American College of Obstetricians and Gynecologists. *Obstet Gynecol*. 2017; 130:168-81.
- Cnatingius S, Johansson S, Razaz N. Apgar score and risk of neonatal death among preterm infants. *N Engl J Med*. 2020;383(1):49-57.
- Duryea EL, Hawkins JS, McIntire DD, Casey BM, Leveno KJ. A revised birth weight reference for the United States. *Obstet Gynecol*. 2014; 124(1):16-22.
- Spyropoulos AC, Levy JH, Ageno W, Connors JM, Hunt BJ, Iba T, et al. Scientific and standardization committee communication: clinical guidance on the diagnosis, prevention, and treatment of venous thromboembolism in hospitalized patients with COVID-19. *J Thromb Haemost*. 2020; 18(8):1859-65.
- Ellington S, Strid P, Tong VT, Woodworth K, Galang RR, Zambrano LD, et al. Characteristics of women of reproductive age with laboratory-confirmed SARS-CoV-2 infection by pregnancy status—United States, January 22–June 7, 2020. *Morb Mortal Wkly Rep*. 2020;69(25):769-75.
- Jering KS, Claggett BL, Cunningham JW, Rosenthal N, Vardeny O, Greene MF, et al. Clinical characteristics and outcomes of hospitalized women giving birth with and without COVID-19. *J Am Med Assoc Int Med*. 2021; 181(5):714-7.
- Adhikari EH, Moreno W, Zofkie AC, MacDonald L, McIntire DD, Collins RR, et al. Pregnancy outcomes among women with and without severe acute respiratory syndrome coronavirus 2 infection. *J Am Med Assoc*. 2020;3(11):e2029256.
- Meiz TD, Clifton RG, Hughes BL, Sandoval G, Saade GR, Grobman WA, et al. Disease severity and perinatal outcomes of pregnant patients with coronavirus disease 2019 (COVID-19). *Obstet Gynecol*. 2021;137(4):571.
- Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med*. 2020; 382(8):727–33.
- Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *New Engl J Med*. 2020; 382:1199–207.
- WHO. Public health emergency of international concern (PHEIC): Who; 2020.
- Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta. Biomedica*. 2020.
- Alfaraj SH, Al-Tawfiq JA, Memish ZA. Middle East Respiratory Syndrome Coronavirus (MERS-CoV) infection during pregnancy: Report of two cases & review of the literature. *J Microbiol Immunol Infect*. 2019; 52(3):501–3.
- Syed S, Noreen H, Masood H, Batool I, Gul H, Naheed N. COVID-19 and pregnancy outcome: an experience in 'COVID-19 management designated' tertiary care hospital, Rawalpindi, Pakistan. *J Rawal Med Col*. 2020;24(Suppl-1):85-91.
- Vouga M, Grobman WA, Baud D. More on Clinical Characteristics of Pregnant Women with Covid-19 in Wuhan, China. *N Engl J Med*. 2020; 383(7):696-697.
- Madjunkov M, Dvir M, Librach C. A comprehensive review of the impact of COVID-19 on human reproductive biology, assisted reproduction care and pregnancy: a Canadian perspective. *J Ovarian Res* 2020; 13(1):140.
- Allotey J, Stallings E, Bonet M, Yap M, Chatterjee S, Kew T, et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. *BMJ* 2020; 370:m3320.
- Saleh Gargari S, Rahmati N, Fateh R, Khandani A, Nikfar S, Ghafouri-Fard S. Investigation of maternal and perinatal outcome in a population of Iranian pregnant women infected with COVID-19. *Sci Rep*. 2022;12(1):9815.
- Juan, J. et al. Effect of coronavirus disease 2019 (COVID-19) on maternal, perinatal and neonatal outcome: Systematic review. *Ultrasound Obstet Gynecol*. 56, 15–27.