

Pregnancy Outcome in First 50 SARS-CoV-2 Positive Patients at Our Center

Madhusudan DEY¹, Sanjay SINGH¹, Ravindu TIWARI¹, Vinod NAIR¹, Devendra ARORA¹, Shyamji TIWARI¹

Delhi, India

ABSTRACT

OBJECTIVES: Suppressed immune system and physiological changes in pregnancy put pregnant women vulnerable to various viral diseases. Various studies have reported adverse pregnancy outcomes in SARS-CoV-2 infection. This study aimed to evaluate the maternal and fetal outcomes in SARS-CoV-2 affected pregnancies at our set up.

STUDY DESIGN: It was a prospective cohort study conducted at a tertiary care Army Hospital, India. The first 50 cases of SARS CoV-2 positive pregnant women and 144 suspected cases that were found SARS-CoV-2 negative, received and managed at separate set up, during a period extending from 01 April 2020 to 15 Sep 2020 were included in our study. Their obstetric and neonatal outcomes along with the demographic and other clinical data were compared.

RESULTS: Total RT-PCR positivity rate of SARS-CoV-2 infection in pregnant women was 2.7%. 96% of our patients were asymptomatic for SARS-CoV-2 infection. Premature rupture of membrane, preterm delivery, and Neonatal intensive care unit admission was similar in both groups. There were increased incidences (70%) of cesarean section in SARS-CoV-2 positive pregnant women.

CONCLUSION: The study reported comparable maternal and fetal outcomes in SARS-CoV 2 positive pregnant women when compared with SARS-CoV-2 negative pregnant women.

Keywords: Neonatal intensive care unit, Preterm delivery, Pregnancy, RT-PCR, SARS-CoV-2

Gynecol Obstet Reprod Med 2021;27(1):11-16

Introduction

Severe Acute Respiratory Syndrome-Corona Virus-2, popularly known as Corona Virus Disease-19 (COVID-19) infection which originated from a wet market in Wuhan, China was declared a global pandemic by WHO on 11 Mar 2020. Since then in India, we have had more than 5 million positive cases with more than 83000 deaths as of 15 Sep 2020. Various epi-

demiological studies indicate that people of all ages are at risk of infection and the disease severity is more with elderly with co-morbidities like hypertension, diabetes, and malignancy (1). The higher vulnerability of these patients is most likely associated with a suppressed immune system due to the underlying diseases or the side-effects of treatments. Similarly, various physiological changes in cardiovascular and respiratory systems in pregnancy might worsen clinical outcomes in pregnant women whenever an infectious disease is contracted. Pregnancy is a special physiological condition in which an immunological adaptation in pregnant women maintains the fetal semi allograft. This immunomodulation is achieved by suppressing T cell activity which may predispose pregnant women to various infectious diseases (2,3).

It was observed that pregnant women were more vulnerable during the 2009 H1N1 influenza pandemic, Severe Acute Respiratory Distress Syndrome (SARS) and Middle East Respiratory Distress Syndrome (MERS) epidemics (4-7). In this current SARS-CoV-2 outbreak, pregnant women have had fewer adverse events when compared to SARS and MERS (8), but it is still unclear whether pregnant women have a comparable clinical course and outcome with non-pregnant women. A recent systematic review of all corona virus-related illnesses (SARS and MERS included) reported a higher incidence of adverse pregnancy outcomes in affected individuals (9). Royal College of Obstetricians and Gynaecologists

¹ Department Obstetrics & Gynecology, Base Hospital and Army College of Medical Sciences Delhi Cantonment New Delhi, India

Address of Correspondence: Vinod Nair
Department of Obstetrics & Gynecology,
Base Hospital Delhi Cantonment,
New Delhi, India, PIN-110010.

Submitted for Publication: 11.12.2020

Revised for Publication: 31.01.2021


Accepted for Publication: 15.02.2021

ORCID IDs of the authors: MD: 0000-0003-3892-1529,

SS: 0000-0002-6073-6023, RT: 0000-0003-3963-9074,

VN: 0000-0001-7715-7346, DA: 0000-0002-8660-6737,

ST: 0000-0001-9007-1651

Quick Response Code:	Access this article online
	Website: www.gorm.com.tr
	e-mail: info@gorm.com.tr
	DOI:10.21613/GORM.2021.1176

How to cite this article: Dey M. Singh S.Tiwari R. Nair V. Arora D.Tiwari S. Pregnancy Outcome in First 50 Sars-Cov-2 Positive Patients at Our Center. *Gynecol Obstet Reprod Med*. 2021;27(1):11-16



Copyright© 2021. Dey et al. This article is distributed under a Creative Commons Attribution 4.0 International License.

(RCOG) recommends Caesarean delivery in SARS-CoV-2 patients only for obstetric indications (10). We are reporting various maternal and fetal outcomes in the first 50 SARS-CoV-2 positive pregnant women in our institute intending to provide additional information for maternity and neonatal services for planning their response to SARS-CoV-2.

Material and Method

This was a prospective cohort study conducted at our tertiary care army hospital, working as a designated Covid set up since Mar 2020. A separate setup of the ward and additional labor room was created for the untested and Covid suspect patients with pregnancy, who needed emergency admission. Proven SARS-CoV-2 positive cases requiring observation-only were kept in Covid ward. During the study period (01 Apr-15 Sep 2020), all the pregnant women requiring admission for delivery or abortion/ observation underwent throat and nasal swab for RT-PCR reverse Transcriptase-Polymerase chain reaction (RT-PCR) test for the detection of SARS-CoV-2 infection. Patients reporting as an emergency case underwent RT-PCR testing soon after admission/ delivery. Till such time RT-PCR test result was not available, they were considered COVID-19 suspects and all precautions to prevent acquiring accidental SARS-CoV-2 infection in form of wearing Personal Protective Equipment (PPE) kit, frequent hand washing/sanitization with alcohol-based hand rubs, and maintaining social distancing were taken. The first 50 COVID-19 patients were carefully followed up and outcomes of their pregnancies were noted. All the pregnant women who reported in emergency and underwent delivery/ suction and evacuation for incomplete abortion with unknown SARS-CoV-2 status before the availability of test results and subsequently found RT-PCR test negative were taken as controls. All the newborns delivered by SARS-CoV-2 positive mothers were allowed to room in with mothers and breastfeeding was permitted. Newborns underwent throat and nasal swab RT-PCR testing of SARS-CoV-2 within 24-48 hours of delivery.

All participants signed informed written consent before being enrolled in the study. The study was reviewed and approved by the Institutional Ethics Committee of Base Hospital & Army College of Medical Sciences Delhi Cantt (Ethics approval reference number: 1156/IEC/07/2020/02 date 11.07.2020). All procedures were performed according to the Declaration of Helsinki.

Statistical analysis

Results were analyzed by using SPSS-23 (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.) Statistical comparison was carried out by students 't' tests and Chi-square test. p-value <0.05 was considered significant.

Result

Since April 2020, we had been testing all the pregnant

women requiring admission at our hospital. Till the first 50 SARS-CoV-2 positive antenatal cases, our hospital had conducted 1800 RT-PCR tests in pregnant women. The total positivity rate at our institution in pregnant women was 2.7% (Figure 1). Out of the 50 positive pregnant women, only two patients had symptoms of upper respiratory tract infection during the second trimester and were found to be SARS-CoV-2 positive for which they were admitted and discharged after recovery. One patient had missed abortion and underwent suction and evacuation for the same. During the same period, 892 SARS-CoV-2 negative pregnant women also delivered out of which 144 women delivered with COVID-19 suspicion (as the RT-PCR result was available only after delivery) and subsequently were found to be negative for the same. For our study purpose, these 144 women were taken as controls.

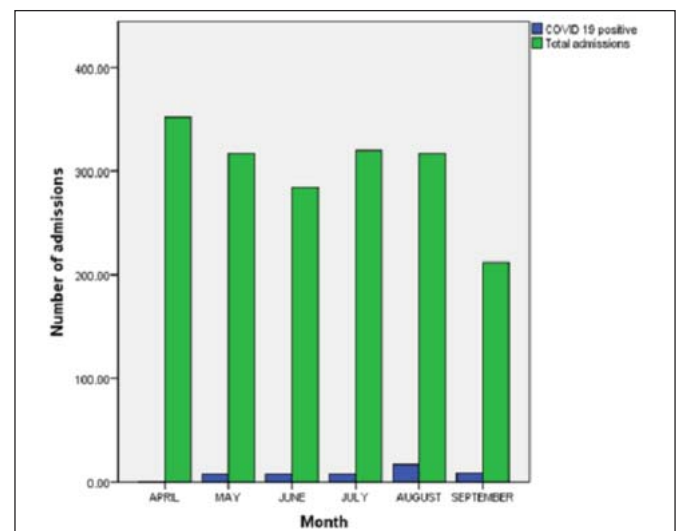


Figure 1: Number admissions, 01 April 2020 to 15 September 2020

All our patients requiring delivery underwent RT-PCR test for admission in the ward and subsequently, a few of them were found to be SARS-CoV-2 positive (Figure 2). Most of the pregnant women were asymptomatic and they underwent RT-PCR testing only for screening before admission. Two (4%) patients had flu-like symptoms (fever, headache, anosmia, and body-ache) and were found to be SARS-CoV-2 positive. Both of them were in the second trimester of pregnancy. One of them turned negative after retesting on the 14th day and the other was found negative on the 17th day after the first positive report. They were admitted for the entire duration though became asymptomatic after 4 days of admission. None of our patients required any specific treatment for the disease itself, though Zinc and vitamin C supplementation were given to all patients. The policy of discharge of dependent families that was: only after repeat SARS-CoV-2 test been negative, was changed after mid-Jun 2020. The repeat test was no more mandatory and a policy of discharge and isolation at home with due precautions after settling down of clinical and obstetric condition of the pregnant mother was adopted by hospital authorities.

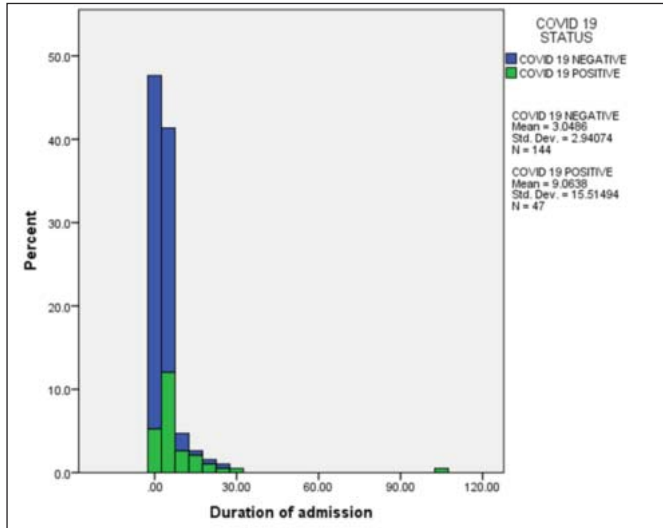


Figure 2: Duration of Hospitalization (in days)

Socio-demographic factors are tabulated in Table I. Gestational diabetes, hypertensive disorders of pregnancy, and anemia were the common antenatal co-morbidities noted (Table II). Intra-hepatic cholestasis of pregnancy (IHCP) rate was found to be significantly higher in the SARS-CoV-2 positive group as compared to controls.

Almost 70% of SARS-CoV-2 positive pregnant women underwent cesarean section as compared to 23% of patients in the control group. Almost 30% of all women delivered before 37 weeks of gestation. 21% of patients had fetal distress in the SARS-CoV-2 positive group and underwent emergency cesarean section (Table III).

The mean duration of hospitalization of SARS-CoV-2 positive patients was 9 days as compared to 3 days for negative patients (Figure 3). Out of 48 newborns (one twin), only one newborn was found to be SARS-CoV-2 positive with the RT-PCR test.

Table I: Demographic factors of the participants

Age of patients	Mode of Delivery		Total	p
	COVID STATUS			
Age	Negative	Positive		
<20 years	7 (4.79%)	2 (4.25%)	9 (4.66%)	0.896
20-30 years	119 (82.19%)	40 (85.10%)	159 (82.90%)	
>30 years	18 (13.01%)	5 (10.63%)	23 (12.43%)	
Total	144	47	191	
	Parity			
Primigravida	55 (38.19%)	22 (46.80%)	77 (40.31%)	0.346
Multigravida	89 (61.80%)	25 (53.19%)	114 (59.6%)	
Total	144	47	191	
	Socioeconomic status			
Low	2 (1.3%)	1 (2.1%)	3 (1.5%)	0.531
Middle	132 (91.6%)	42 (89.3%)	174 (91%)	
High	10 (6.9%)	04 (8.5%)	14 (7.3%)	

Table II: Antenatal co-morbidities of the participants

Co-morbidity	Antenatal Co-morbidity		Total	p
	COVID Status			
	Negative	Positive		
GDM	12	6	18	0.336
Hypertension	6	4	10	0.246
Hypothyroidism	8	6	14	0.100
Placenta previa	0	1	1	0.079
Post LSCS	17	4	21	0.531
Post IVF ET	2	3	5	0.063
IHCP	1	3	4	0.018
Rh Negative	5	1	6	0.646
Twin Pregnancy	4	2	6	0.614
Anemia	13	5	18	0.834

GDM: Gestational diabetes mellitus, LSCS: Lower segment caesarean section, IVF ET: In vitro fertilization-Embryo transfer, IHCP: Intrahepatic cholestasis of pregnancy

Table III: Labor and delivery outcomes

Mode of Delivery				
Mode of Delivery	COVID Status		Total	p
	Negative	Positive		
Normal Vaginal Delivery	111 (77.08%)	14 (29.78%)	125 (65.44%)	<0.005
Elective LSCS	7 (4.86%)	12 (25.53%)	19 (9.94%)	
Emergency LSCS	26 (18.05%)	21 (44.68%)	47 (24.6%)	
Total	144	47	191	

POG at delivery				
Period of Gestation	COVID Status		Total	p
	Negative	Positive		
<37 weeks (Preterm)	45 (31.25%)	11 (23.40%)	56 (29.31%)	0.305
>37weeks (term)	99 (68.75%)	36 (76.59%)	135 (70.68%)	
Total	144	47	191	

Labor and Intra/ postpartum Complications				
Complications	COVID Status		Total	p
	Negative	Positive		
Abruption	1	0	1	0.567
Fetal Distress	7	10	17	0.001
PPH	02	-	02	-
PROM/ PPROM	17	10	27	0.106
NPOL/ Arrest of labor	3	1	4	0.985
MSL	9	1	10	0.271
NICU admission	12	3	25	0.435

LSCS: Lower segment caesarean section, PPH: Post-partum hemorrhage, PROM=PPROM = Preterm PPROM: Premature rupture of membranes, NPOL: Non-progress of labor, MSL: Meconium stained liquor, NICU: Neonatal intensive care unit. LSCS: Lower segment caesarean section, PPH: Post-partum hemorrhage

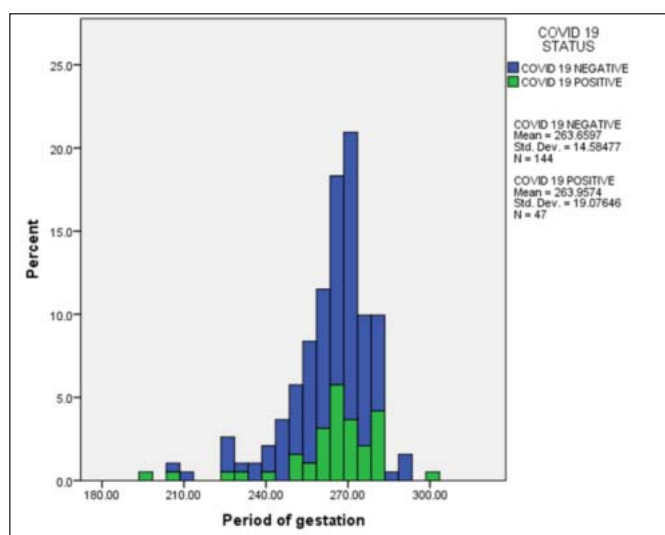


Figure 3: Period of Gestation (in days)

Discussion

During pregnancy, immune function is relatively suppressed as compared to non-pregnant women and physiologi-

cal changes during pregnancy also are added risk factors for adverse outcomes. Transplacental transmission of SARS-CoV-2 from mother to fetus has been difficult to confirm. Placentas from cases where both mother and neonate are infected are characterized by chronic histiocytic intervillitis, together with syncytiotrophoblast necrosis (11). As per recent reports (6,12), it is known that various adverse pregnancy outcomes like spontaneous abortion, intrauterine growth restriction, and premature deliveries were seen in pregnant women infected with SARS-CoV-2 and maternal mortality can be as high as 25%. In our study, we did not however find such association with SARS-CoV-2 positive patients. Though 23% of SARS-CoV-2 positive patients had a preterm delivery and almost a similar number of (31%) negative patients also had preterm deliveries.

In our cohort, there were relatively higher incidences of cesarean section (70%) in SARS-CoV-2 positive patients when compared to negative (23%) pregnant women. When we compared with various other studies, cesarean rates were found to be higher in COVID-19 cases (13,14). IVF-ET, post-

cesarean status, fetal distress were the important reasons for increased incidences of cesarean deliveries in our study. Certain SARS-CoV-2 positive high-risk cases such as multi-fetal gestation, previous cesarean delivery, etc. where the likelihood of cesarean section is quite high, underwent elective cesarean sections without undergoing a trial of labor. In addition to this, the belief that prolonged labor exposes the health care worker to SARS-CoV-2 also may have played a role in the high cesarean rate. None of the cesarean patients had surgical site infection, possibly implying that the virus does not alter the surgical site healing process. Though 23% of patients had a preterm delivery, only 3 newborns required neonatal intensive care unit (NICU) admission. Among these 3 newborns, there was one set of twins delivered at 29 weeks of gestation.

All the neonates underwent throat and nasal swabs RT-PCR test for SARS-CoV-2 within 24-48 h post-delivery as per study protocol. Out of 48 newborns (one set of twins), one newborn was found to be positive for SARS-CoV-2. The lady had mono chorionic monoamniotic twin pregnancy with TTTS (twin to twin transfusion syndrome) and one twin had a reversal of end-diastolic flow at 29 weeks of gestation. She underwent an emergency cesarean and both the babies were admitted to NICU. Throat and a nasal swab taken 28 hours post-delivery and one twin turned out to be positive for SARS-CoV-2. We are not clear about the reason behind the positive report as the other twin was negative for the same. Both the babies had NICU stays for almost 90 days and were discharged thereafter. After 10 days, the SARS-CoV-2 positive neonate was found to be RT-PCR negative.

We acknowledge the fact that our study is limited by the small sample size and incomplete information on the outcome of the infants beyond the time of data collection. However, our findings are important for understanding the characteristics of the disease in pregnant patients and their infants.

All SARS-CoV-2 positive women who delivered at our center had similar maternal and fetal outcomes as compared with SARS-CoV-2 negative mothers. There was an increased incidence of cesarean delivery in SARS-CoV-2 positive women. Our findings can provide additional guidance to enhance prenatal counseling of patients with COVID-19 infection during pregnancy.

Acknowledgment: We are grateful to all participants and their families who spent their precious time and participated in this research program. We are also thankful for the tireless efforts of the research team members.

Conflict of interest: The authors declare that they have no competing interests.

Funding: This study was not supported by any financial grant from any agency.

Ethics approval and consent to participate: All participants signed informed written consent before being enrolled in the

study. The study was reviewed and approved by the Institutional Ethics Committee of Base Hospital & Army College of Medical Sciences Delhi Cantt (Ethics approval reference number: 1156/IEC/07/2020/02 date 11.07.2020). All procedures were performed according to the Declaration of Helsinki.

Availability of data and materials: The data supporting this study is available through the corresponding author upon reasonable request.

Authors contributions: MD:,SS: and DA: Raised the presented idea. RT: and VN: Designed the study. ST: Conducted the analyses. MD: Developed the first draft of the manuscript. All authors contributed to the writing of the paper, and have read and approved the final manuscript.

References

1. Wu Z. McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72 314 cases from the Chinese center for disease control and prevention. *JAMA*. 2020;323(13):1239-42. doi: 10.1001/jama.2020.2648.
2. Longman RE. Johnson TR. Viral respiratory disease in pregnancy. *Curr Opin Obstet Gynecol*. 2007;19(2):120-5. doi: 10.1097/GCO.0b013e328028fdc7.
3. Pazos M. Sperling RS. Moran TM. Kraus TA. The influence of pregnancy on systemic immunity. *Immunologic Research* 2012;54(1-3):254-61. doi: 10.1007/s12026-012-8303-9.
4. Jamieson DJ. Honein MA. Rasmussen SA. Williams JL. Swerdlow DL. Biggerstaff MS. et al. H1N1 2009 influenza virus infection during pregnancy in the USA. 2009;374(9688):451-8. doi:10.1016/S0140-6736(09)61304-0.
5. Rasmussen SA. Smulian JC. Lednicky JA. Wen TS. Jamieson DJ. Coronavirus disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. *Am J Obstet Gynecol*. 2020;222(5):415-26. doi: 10.1016/j.ajog.2020.02.017.
6. Schwartz DA. Graham AL. Potential maternal and infant outcomes from (Wuhan) coronavirus 2019-ncov infecting pregnant women: lessons from SARS, MERS, and other human coronavirus infections. *Viruses*. 2020;12(2):194. doi: 10.3390/v12020194.
7. Wang S. Guo L. Chen L. Liu W. Cao Y. Zhang J. et al. A case report of neonatal 2019 coronavirus disease in China. *Clin Infect Dis*. 2020;71(15):853-7. doi: 10.1093/cid/ciaa225.
8. Qiao J. What are the risks of COVID-19 infection in pregnant women? *Lancet*. 2020;395(10226):760-2. doi: 10.1016/S0140-6736(20)30365-2.
9. CDC COVID-19 Response Team. Severe outcomes among patients with coronavirus disease 2019 (COVID-

- 19)-United States, February 12-March 16, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(12):343-6. doi: 10.15585/mmwr.mm6912e2.
10. Royal College of Obstetricians and Gynaecologists (RCOG). COVID 19 pregnancy guidelines RCOG. United Kingdom, 2020. Available from: <https://www.rcog.org.uk/globalassets/documents/guidelines/2020-10-14-coronavirus-covid-19-infection-in-pregnancy-v12.pdf>
11. Schwartz DA, Morotti D. Placental pathology of Covid-19 with and without fetal and neonatal infection: trophoblast necrosis and chronic histiocytic intervillitis as risk factors for transplacental transmission of SARS-CoV-2. *Viruses.* 2020;12(11):1308. doi: 10.3390/v12111308.
12. Di Mascio D, Khalil A, Saccone G, Rizzo G, Buca D, Liberati M, et al. Outcome of coronavirus spectrum infections (SARS, MERS, COVID-19) during pregnancy: a systematic review and meta-analysis. *Am J Obstet Gynecol MFM.* 2020;2(2):100107. doi: 10.1016/j.ajogmf.2020.100107.
13. Antoun L, Taweel NE, Ahmed I, Patni S, Honest H. Maternal COVID-19 infection, clinical characteristics, pregnancy, and neonatal outcome: A prospective cohort study. *Eur J Obstet Gynecol Reprod Biol.* 2020;252:559-62. doi: 10.1016/j.ejogrb.2020.07.008.
14. Qiancheng X, Jian S, Lingling P, Lei H, Xiaogan J, Weihua L, et al. Coronavirus disease 2019 in pregnancy. *Int J Infect Dis.* 2020;95:376-83. doi: 10.1016/j.ijid.2020.04.065.