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## RESEARCH ARTICLE

### MATERNO-FETAL OUTCOME AMONG SARS-CoV-2 POSITIVE PREGNANT WOMEN: EXPERIENCE FROM COVID 19 DEDICATED MATERNITY HOSPITAL; SKIMS MCH, SRINAGAR

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#### ABSTRACT

COVID-19 has affected the population worldwide drastically with a tremendous impact on obstetric population which has led to serious concerns regarding maternal and fetal outcomes. Although there are recommended guidelines regarding delivery and management of complications, due to changes in characteristics of COVID-19 infection, they are constantly changing and evolving. **Methods:** Prospective cohort study done during the covid pandemic from 1<sup>st</sup> April 2020 to 15<sup>th</sup> Feb 2022 in the department of Obstetrics & Gynecology, SKIMS MCH Srinagar J&K. The parameters measured were severity of covid disease, maternal age, gestational age, parity, blood investigations, mode of delivery, APGAR score, neonatal infection status and post-delivery complications. **Results:** A total of 311 pregnant covid 19 positive patients were included in the study who were actively managed. 239 (76.85%) were delivered by caesarean section and 72 (23.15%) by NVD. 92% patients had mild symptoms only, 8% had severe symptoms with 1.6% rate of ICU admission and 1.2% mortality rate. 83% delivered at term, 17% had preterm deliveries. 8% patients had pneumonitis with positive findings on CT scan. 24% patients had anemia, 12% had GDM, 10% had PIH, 12.86% had IHCOP, 5% had PPH, 1.6% had APH. All the neonates were negative for covid 19. 80% babies had an APGAR score of  $\geq 8/10$  at 1 min of birth with a mean birth weight of 2400g $\pm$ 500. No post delivery complication was noted. **Conclusion:** Our study concludes that SARS-CoV-2 infection can lead to unfavorable maternal and perinatal outcomes.

## INTRODUCTION

COVID-19 has affected the population worldwide drastically, with a tremendous impact on obstetric population especially in the second wave of pandemic which has led to serious concerns regarding maternal and fetal outcomes. Pregnancy causes physiological changes in the respiratory and circulatory systems as well as alterations in immunological reactions. These are the primary factors that are likely to make pregnant women more vulnerable to viral infections. (1) The common changes in the respiratory system that are likely to increase the susceptibility of a pregnant woman to respiratory infections include reduced functional residual volumes, elevation of the diaphragm, relaxation of ligaments in the ribs, increased pulmonary hypertension resulting in hyperventilation, and even hypoxic respiratory failure (1,2) Altered cell immunity increases pregnant women's risk of an immunocompromised state, thereby making them more prone to develop worst outcomes. Moreover, viral infection in pregnancy can result in modification of the cardiovascular system, increased metabolic rate and consumption of oxygen, higher pulmonary vascular resistance, and even heart failure. Additionally, during the third trimester of pregnancy, the probability of physical

dyspnea is high (due to increased maternal oxygen demands, gestational anemia, and consumption of fetal oxygen) leading to further worsening of breathing difficulties. Respiratory problems are expected to increase in pregnant women with COVID-19. However, it should be noted that the potential risks of cytokine storm due to infection in pregnant women may lead to severe complications and even death (3). Together, these factors make pregnant women and their fetuses more vulnerable to infectious diseases (4). Although there are recommended guidelines (both national and international) regarding delivery and management of complications, due to changes in characteristics of COVID-19 infection, they are constantly changing and evolving. Each case is different in its way, hence an individualized approach needs to be adopted (5). The questions that require immediate attention include the following:

- Whether the symptoms of the disease in pregnant women with COVID-19 differ from symptoms in non-pregnant women.
- Whether complications of the disease and mortality rate are higher in pregnant women than in non-pregnant women.
- Whether there is a chance of premature delivery or fetal mortality, or even vertical transmission of the disease. (6,7) Finding answers to these questions are crucial for planning effective obstetrical management for pregnant women with COVID-19.

**AIM OF THE STUDY:** The aim of the study was

- To study the impact of covid 19 on pregnancy outcome
- To study the risk of intrapartum fetomaternal transmission during birth

## METHODS

An observational study was done during the covid 19 pandemic from 1st April 2020 to 15th Feb-2022 in the department of Obstetrics & Gynecology, SKIMS MCH Bemina Srinagar. A total of 311 pregnant women who had confirmed covid positive test by RTPCR and were actively managed were included in study. The parameters measured were severity of covid 19 disease, maternal age, gestational age, parity, blood investigations, mode of delivery, Apgar score, neonatal infection status and post-delivery complications.

## RESULTS

A total of 311 pregnant covid 19 positive patients were included in the study who were actively managed. The mean maternal age was 28 years (Range 20 to 38). The percentage of primigravida was 30.86% and multigravidas was 69.14%. 239 (76.85%) were delivered by casearean sec and 72(23.15%) by NVD. 92% patients had mild symptoms only, 8% had severe symptoms with 1.4% rate of ICU admission.

### MATERNAL CHARACTERISTICS OF ACTIVELY MANAGED PATIENTS

MEAN MATERNAL AGE	28 YEARS (RANGE 20-33)	
GRAVIDITY		
*PRIMIGRAVIDA	96	30.86%
*MULTIGRAVIDA	215	69.14%
HISTORY OF EXPOSURE	311	100%
SEVERITY OF DISEASE		
*MILD DISEASE	286	91.97%
*SEVERE DISEASE	25	8.03%
*PNEUMONITIS	23	7.40%

### MATERNAL OUTCOMES OF ACTIVELY MANAGED PATIENTS

PREGNANCY OUTCOME		
*TERM	258	82.96%
*PRETERM	51	16.40%
*IUD	2	0.64%
MODE OF DELIVERY		
*NVD	72	23.15%
*LSCS	239	76.85%
MATERNAL ICU ADMISSION	5	1.6%
MATERNAL DEATH	4	1.2%
POST DELIVERY COMPLICATIONS	0	0%

### NEONATAL OUTCOMES OF ACTIVELY MANAGED PATIENTS

MEAN BIRTH WEIGHT	2400GM±500	
APGAR SCORE		
*≥ 8/10	249	80.07%
*<7/10	62	19.93%
FETAL DISTRESS	24	7.7%
NEONATAL ICU ADMISSION	11	3.53%
NEONATAL DEATH	0	0
SARS COV2 POSITIVITY	0	0

### ABNORMAL LABORATORY PARAMETERS OF ACTIVELY MANAGED PATIENTS

LEUCOCYTOSIS	71	22.83%
LYMPHOPENIA	21	6.75%
DERRANGED LIVER ENZYMES	40	12.86%
C-REACTIVE PROTEIN	17	5.46%

### OBSTETRICAL COMPLICATIONS OF ACTIVELY MANAGED PATIENTS

ANEMIA	75	24.1%
GESTATIONAL DIABETES	37	11.9%
PREGNANCY INDUCED HYPERTENSION	31	9.96%
INTRAHEPATIC CHOLESTASIS OF PREGNANCY	40	12.86%
ANTEPARTUM HEMORRHAGE	5	1.60%
POSTPARTUM HEMORRHAGE	16	5.14%

The most common presenting symptoms were cough-49%, fever -27.69% and myalgia/ malaise-23.31%. 83% delivered at term, 17% had preterm deliveries. 8% patients had pneumonitis with positive findings on CT scan. 22.83% had leucocytosis, 6.75% had lymphopenia, 12.86% had derranged liver enzymes, 5.46% had positive C- Reactive protein, 24% patients had anemia, 12% had GDM, 10% had PIH, 12.86% had IHCP, 5% had PPH, 1.6% had APH. All the neonates were negative for covid 19. 80% babies had an APGAR score of  $\geq 8/10$  at 1 min of birth with a mean birth weight of  $2400g \pm 500$ . No post delivery complication was noted.

## DISCUSSION

In this study, the mean maternal age was 28 years (Range 20 to 38) which was comparable to a study by Yan *et al.* in which the mean maternal age was 30.8 years (Range 24 to 41) (8). In this study, the percentage of primigravida was 30.86% and multigravidas was 69.14%. In a study by Shree P *et al.*, Primigravida women were 40.38% while multigravidas were 59.62% (9). In this study, covid 19 positive pregnant women were mostly mildly symptomatic- 91.97%. 8.03% had severe disease, 7.40% had pneumonitis, 1.6% needed ICU admission. 4 maternal deaths occurred during the study period. In a study by Shree P *et al.*, ICU admission rate was 1.9%; only one maternal death occurred (9). The most common presenting symptoms were cough-49%, fever -27.69% and myalgia/ malaise-23.31%. While in the study by Gupta *et al.*, fever and myalgia were the most common presenting symptoms followed by cough (10.8%) (10). In this study, term deliveries were seen in 258 (82.96%) patients, while 51 (16.40%) patients had a preterm delivery, and two (0.64%) patients had intrauterine demise of the baby. The rate of preterm delivery was 13.5% in the study by Gupta *et al.* (10). In this study, the percentage of normal vaginal delivery was 23.18% and cesarean section was 76.85%. In the study by Singh *et al.*, a cesarean section was performed among 63.93% women and 36.07% delivered vaginally (11). However, high cesarean rates in COVID-19-infected pregnant women were also observed in some other studies (12, 13). In this study the mean birth weight of the babies was  $2400 \pm 500g$ . Most of the babies (80.07%) had a good Apgar score of  $> 8/10$ . 19.93% babies had an Apgar score of  $< 7/10$ . 24 babies had fetal distress, 11 babies were admitted to NICU. There was no neonatal death, and no SARS COV 2 positivity among the newborns.

In the study by Gupta *et al.*, all neonates were COVID 19 negative on day one of their life which ruled out the intrauterine transmission of COVID-19 from positive mothers during the third trimester (10). The COVID-19 virus has been detected in vaginas, cervical, and anorectal swabs obtained from COVID-19-positive pregnant women in many studies, but we did not perform this test in our study (14,15). In this study, out of 311 women, 107 (34.40%) women did not have any comorbidities, while 75 (24.1%) patients had anemia, 37 (11.9%) had Gestational Diabetes, 31 (9.96%) had gestational hypertension, 40 (12.86%) had intrahepatic cholestasis of pregnancy, 5 (1.60%) patients presented with Antepartum hemorrhage and 16 (5.14%) patients had postpartum hemorrhage. Among the abnormal laboratory parameters, 71 (22.83%) patients had leucocytosis, 21 (6.75%) patients had lymphopenia, 40 (12.86%) patients had deranged liver enzymes, 17 (5.46%) had positively C reactive protein. While in the study by Islam *et al.*, the most common complications noted were gestational hypertension, pre-eclampsia, and premature rupture of membranes. However, fewer women had anemia or GDM (16). Some limitations of this study were small sample size, single-center design, no data on COVID-19 testing in amniotic fluid, placenta, and cord blood samples, no long-term follow-up of neonates.

## CONCLUSION

In the present study, our experience at a large COVID-19 dedicated maternity hospital during the SARS-CoV-2 pandemic is quite instructive. The majority of the pregnant women were asymptomatic at the time of admission. Universal testing predicted higher rates of asymptomatic prevalence among SARS-CoV-2 positive pregnant women as well. Our study finds out that SARS-CoV-2 infection can lead to unfavorable maternal and perinatal outcomes including higher rates of cesarean delivery, preterm birth, fetal distress, low birth weight, and low Apgar score and higher rates of obstetric complications in pregnant women admitted for delivery. Mother-to-child vertical transmission of SARS-CoV-2 may be possible. However, vertical transmission of SARS-CoV-2 from mother to infant could not be confirmed in the present study. Extensive research work should be carried out to evaluate the longterm outcomes and the potential of vertical transmission of SARS-CoV-2 to infants. Management and treatment of SARS-CoV-2 positive pregnant women varies. Various therapies such as antibiotics based therapy (cefoperazone, sulbactam, ceftriaxone, cefazolin, and azithromycin), antiviral therapy (lopinavir, ritonavir, remdesivir, oseltamivir, and ganciclovir), corticosteroid therapy (prednisone, dexamethasone, and hydrocortisone), interferon beta, chloroquine, hydroxychloroquine, and ivermectin may be used for effective treatment of SARS-CoV-2 positive pregnant women. However due to the nonavailability of data regarding the safety and efficacy of most of the COVID-19 treatments for pregnant women available in the literature, we used only antibiotics and corticosteroids such as dexamethasone only in the current study. In the present cohort, most of the SARS-CoV-2 positive pregnant women showed mild to moderate illness with no cases of severe and critical illness. Only 1.4% SARS-CoV-2 positive pregnant women needed oxygen support and ventilator support in the present study. Antibiotics play a vital role in preventing secondary bacterial infections and strengthening the immune system of pregnant women with a significant reduction in complications and mortality as well.

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