

THE MATERNAL AND FETAL OUTCOMES OF COVID 19 PREGNANT WOMEN IN TERTIARY CARE CENTRE



Gynecology

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ABSTRACT

Outbreaks of new and emerging viral diseases have always caused anxiety among persons and societies at risk for infection.. Pregnant women, their fetuses, and infants are generally the most vulnerable members of society during an infectious disease outbreak. The normal physiological, anatomical and immunological changes that accompany pregnancy may increase a pregnant woman's susceptibility to a newly emergent viral pathogen as well as increase the severity of infection.

MATERIAL AND METHODS: The study was conducted in Department Of Obstetrics And Gynaecology, Sultania Zanana Hospital, Gandhi Medical College, Bhopal. It included all the antenatal COVID 19 patients which reported to the hospital after taking due informed consent. Data on clinical manifestations, laboratory tests, maternal and perinatal outcomes were extracted and analyzed.

RESULTS: There were 90 confirmed pregnant women with coronavirus disease 2019 (COVID-19). 4 maternal deaths occurred from these confirmed cases. Compared to pregnant women without COVID-19, pregnant women with a confirmed COVID-19 diagnosis had an increased risk of maternal complications and cesarean section. Among these newborns that were born to mothers with confirmed COVID-19, 6 was tested severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) positive.

CONCLUSION: The study suggests that COVID-19 during the later pregnancy is associated with an increased risk of adverse birth outcomes, including cesarean section delivery. Our data provide little evidence for maternal-fetal vertical transmission of SARS-CoV-2. It is important to monitor the long-term health effects of SARS-CoV-2 infection on pregnant women and their children.

KEYWORDS

INTRODUCTION

Outbreaks of new and emerging viral diseases have always caused anxiety among persons and societies at risk for infection. This has been especially true for pregnant women, who fear not only for themselves but often even more so for their unborn infants. Pregnant women, their fetuses, and infants are generally the most vulnerable members of society during an infectious disease outbreak. The normal physiological, anatomical and immunological changes that accompany pregnancy may increase a pregnant woman's susceptibility to a newly emergent viral pathogen as well as increase the severity of infection.

The immunocompromised state of pregnant women make more vulnerable to severe infections.(1) Anatomical changes such as an increase in the transverse diameter of the thoracic cage and an elevated level of the diaphragm to add to it like decrease maternal tolerance to hypoxia.(2) Lung volume changes and vasodilation can lead to mucosal edema and increased secretions in the upper respiratory tract. In addition, alterations in cell-mediated immunity contribute to the increased susceptibility of pregnant women to be infected by intracellular organisms such as viruses.(3)With regard to the fetus and the newborn, the immaturity of the innate and adaptive immune systems makes them highly susceptible to infections.(4)

Dysregulation of factors such as cytokines and the complement cascade can have deleterious consequences for brain development and function.(5) To find out whether an infectious agent can infect the fetus or newborn by vertical transmission is therefore of particular interest.(6) Pregnant women and their newborns should be evaluated for being potential risk groups in the current COVID-19 pandemic. Data on the maternal and perinatal outcomes of pregnant women infected with the SARS-CoV-2 are limited to a handful of case reports and series. The sample sizes are small and the findings are diverse. We aimed to conduct a review of available published literature on pregnancies affected by COVID-19 and present a mixed narrative and quantitative synthesis of the clinical manifestations and maternal and perinatal outcomes in our tertiary care centre.

MATERIAL AND METHODS

The study was conducted in Department Of Obstetrics And Gynaecology, Sultania Zanana Hospital, Andhi Medical College

,Bhopal. It included all the antenatal COVID 19 patients which reported to the hospital after taking due informed consent. The detailed history and full clinical and general examination was performed using a predesigned proforma. The antenatal patients were categorized into mild, moderate and severe. Data on clinical manifestations, laboratory tests, maternal and perinatal outcomes were extracted and analyzed.

RESULTS -

There were 90 confirmed pregnant women with coronavirus disease 2019 (COVID-19). 4 maternal deaths occurred from these confirmed cases. Compared to pregnant women without COVID-19, pregnant women with a confirmed COVID-19 diagnosis had an increased risk of maternal complications and cesarean section. Among these newborns that were born to mothers with confirmed COVID-19, 6 was tested severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) positive.

Table 2 shows various symptomatology of covid 19 infection during pregnancy. The clinical features vary from being asymptomatic and symptomatic. Among symptomatic further they were categorized from mild, moderate and severe disease. In our study most of the patients were symptomatic only 6 had no symptoms. among then was fever was the commonest symptom followed by cough and breathlessness. Only 7 cases gave the history of contact with covid positive patients and 2 cases had travel history. (figure 1)

More than 50% of the pregnant women had moderate infections in terms of severity this is because of the anatomical changes such as an increase in the transverse diameter of the thoracic cage and an elevated level of the diaphragm that decrease maternal tolerance to hypoxia. The supportive and symptomatic treatment were given to these patients and they were discharged with in 14 days. (table 3)

Table 4 shows the maternal outcome in covid 19 pregnant women. Out of 90 pregnant women, 42 patients underwent LSCS, 12 had vaginal deliveries, 3 underwent manual vacuum aspiration for incomplete abortion and rest are in their antenatal period. Among 42 LSCS, most common indication was fetal distress(18), followed by previous 1 LSCS in 13 patients followed by contracted pelvis, malpresentation, and twins. There was increased number of LSCS due to fetal distress which was per se because of maternal distress. Also, the patients in

which there was obstetric indication the LSCS was done before 39 (12,13) weeks because the moderate disease could in no time flare up to severe form which in turn can affect the maternal as well as the fetal outcome. (16)

Table 5 shows the fetal outcome among covid 19 pregnant women.

47 newborns were healthy, 4 had intrauterine demise, 3 were referred for respiratory distress to NICU and among 3 there was abortion. In our study it was observed that 29 newborn had above average birth weight, 22 were low birth weight and 3 were very low birth weight. Among the newborns 29 were male and 25 were female.

Among 54 newborns, 6 were covid 19 positive with no symptoms except for 2 newborns who were admitted for about 10 days in NICU with fever and diarrhea.

2 symptomatic newborns belong to the mother who succumbed due to severe covid infection. (15) Thus we can speculate that the severity of disease can be responsible for the vertical transmission (10,11)

DISCUSSION

Using population-based data for all pregnant women and their singleton live births in medical college, we for the first time investigated if SARS-CoV-2 infection affects pregnancy outcomes. Our study results showed that pregnant women with confirmed COVID-19 had an increased risk of adverse birth outcomes including low birth weight, intrauterine fetal demise, and delivery with cesarean section. Early studies have shown that physiologic and immunologic changes during pregnancy might increase the risk for pregnant women to be infected with respiratory viruses such as influenza [7]. It has been reported that pregnant women are more susceptible to be infected, develop more severe complications of the disease, and have higher mortality compared to the nonpregnant population [8]. Unlike several hospital-based studies with small sample sizes that have shown that SARS infection increases morbidity and mortality of pregnant women [9], 4 deaths were reported among the confirmed COVID-19 cases. In our study, the confirmed COVID-19 mothers had lower educational attainment than mothers without the disease. People with lower education are more likely to get infected as they do not follow the hand hygiene and mask etiquettes. Increased interpersonal contacts at their household, further increase their risk of infection. Our study demonstrated that pregnant women with COVID-19 were more likely to have low birth weight babies. Considering all babies were born to infected mothers were low birth weight due to intrauterine fetal distress. Previous studies have also shown that SARS and Middle East respiratory syndrome (MERS) infections are related to preterm birth, intensive care treatment for newborns, and even perinatal death [9]. A higher rate of cesarean section was found among the infected mothers in the present study. However, only when there were indications posed by SARS-CoV-2 infection to pregnant women or fetuses, such as maternal breathlessness and related complications as well as fetal intrauterine distress, cesarean sections were performed as needed. Thus, those symptoms of COVID-19 have contributed to the high rate of cesarean section among the infected mothers. Among 54 newborns born to 90 mothers with confirmed COVID-19 had tested for SARS-CoV-2, and 6 of them had positive test results.

The papers published so far on pregnancy and coronavirus infections, including COVID-19, SARS, and MERS, offer some important lessons for obstetricians, although the currently available data is insufficient. Most of the affected pregnant women have been in their third trimester, but for women in early gestation, abortion risk may be significantly higher with SARS infection. Pregnant women may have a significantly worse clinical course, and mortality rates may be significantly higher than in non-pregnant individuals. Another important point is that pregnant women with Coronavirus infection who seem mild or asymptomatic at admission may rapidly progress to severely or critically ill, at which point fetal death might occur. Close surveillance of an infected mother and timely delivery of the fetus are therefore crucial to avoid further complications and mortality. The mode of delivery appears to be cesarean section in most cases, mainly due to fetal distress and other obstetric indications, but reported cases of spontaneous vaginal delivery that were not associated with poorer outcomes supports the avoidance of unnecessary cesarean sections in these cases. Among 54 newborns, 6 were covid 19 positive with no symptoms except for 2 newborns who were admitted for about 10 days in NICU with fever and diarrhea.

Among 4 mortalities, 1 with the severe covid infection who delivered twins her neonates were hospitalized for 14 days on NICU due to covid symptoms.

Thus it can be concluded that the severity of disease affects both the maternal and fetal outcome. The lack of maternal-fetal transmission was also reported in early studies of SARS and MERS infection in pregnant women [9]. However, several recent case series have suggested a possibility of vertical transmission of SARS-CoV-2, including a recently reported single case study from Wuhan that shows a neonate born to a mother with COVID-19 had elevated IgM antibody level 2 h after birth [10, 11]. Since IgM antibodies are not transferred to the fetus via the placenta [12], and usually do not appear until 3 to 7 days after infection, the observation appears to support that the neonate was infected in utero.

Finally, IgM antibodies against Coronaviruses have been shown in the umbilical cords of newborns in a few reports, but there is currently no convincing evidence of intrauterine transmission of the virus based on the negative PCR results of samples from amniotic cavities and placentas.

CONCLUSION

The pregnant women and newborns belong to vulnerable populations. The study suggests that pandemic like COVID-19 is associated with the increased adverse perinatal outcome both in terms of mortality and morbidity though the study provides little evidence of vertical transmission. It becomes yet more important to monitor the long term effects of covid infection in mother and children.

Acknowledgments

We would like to give special thanks to the Department of medicine and pulmonary medicine with their cooperation we were able to manage all our covid 19 pregnant women successfully.

Conflict of interest

There was no conflict of interest.

Table 1- Table shows the demographic variables including age, education, socio-economic status and gravidity.

Baseline variables		Frequency	Percent
Age (26.9±4.6)	≤25	39	44.3
	26-35	45	51.1
	>35	4	4.5
Education	Illiterate	47	53.4
	Primary	5	5.7
	Middle	1	1.1
	High school	5	5.7
	Higher secondary	27	30.7
	Graduate	3	3.4
Socioeconomic status	Lower	45	51.1
	Upper lower	12	13.6
	Lower middle	25	28.4
	Upper middle	6	6.8
Gestational age (31.9±9.4 weeks)	1 st trimester	6	6.8
	2 nd trimester	16	18.2
	3 rd trimester	66	75.0
Gravida	1	39	44.3
	2	26	29.5
	3	13	14.8
	>4	10	11.3

Table 2 –shows the clinical presentation of covid 19 infection in pregnancy

Clinical features	Frequency	Percent
Fever (3.9±1.4 days)	49	55.7
Cough (3.96±1.19 days)	27	30.7
Breathlessness	4	4.5
Sore throat	3	3.4
Gastritis	1	1.1
Asymptomatic	6	4.6

Table 3 Severity of covid 19 infection

Mild	38	43.2%
Moderate	46	52.3%
Severe	4	4.5%

figure 1 clinical manifestation of covid 19 in pregnant women

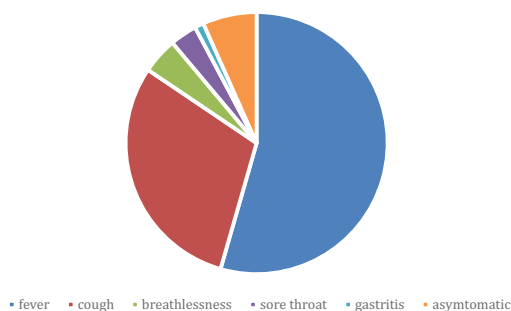


Table 4 shows the maternal outcome due to covid 19 infections

Maternal outcome		Frequency
Mode of delivery And indication of delivery	Undelivered	31
	NVD	11
	LSCS	42
	MVA	3
	VBAC	1
	contracted pelvis	3
	fetal distress	18
	induction failure	1
	Previous LSCS	13
	second stage arrest	1
	Malpresentation	4
	twin	3
Final outcome	Discharged	84
	ICU admission	1
	Mortality	3

Table 5 shows the fetal outcome due to covid 19 infections

Fetal outcome		Frequency	Percent
Fetal outcome (n=57)	Abortion	3	5.3
	IUFD	4	7.0
	IUGR	1	1.8
	Alive and Healthy	47	82.4
	Refer for Respiratory distress	2	3.6
Birth weight (n=54) (2.6±0.6)	<1.5	3	5.6
	1.6-2.5	22	40.7
	>2.5	29	53.7
Gender (n=54)	Male	29	53.7
	Female	25	46.3
Fetal complications (n=57)	Abortion	3	5.3
	IUFD	4	7
	IUGR	1	1.8
	Preterm	1	1.8
	Referred	2	3.6
	respiratory Distress	3	5.3
COVID Status (n=54)	Positive	6	11.1
	Negative	48	88.9

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