

**Original Article**

**FETO-MATERNAL OUTCOME AMONG COVID-19 POSITIVE WOMEN DELIVERED IN A LEVEL III COVID HOSPITAL AT MORADABAD, WESTERN UP**

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**ABSTRACT**

**Background:** The ongoing pandemic situation by a highly infective Covid-19 virus is a global health threat. Pregnancy related physiological changes of cardio-respiratory system and relative immunosuppression might cause more infectivity and worsening complications of this novel respiratory virus infection. Limited data availability on feto-maternal outcome of Covid 19 positive pregnant women necessitates the current study.

**Methodology:** A prospective cohort study was conducted in a government designated level III Covid care hospital at Teerthankar Mahaveer Medical College & Research Centre to assess the feto-maternal outcome in Covid 19 RT-PCR test positive pregnant women delivered between April 2020 to September 2020. Mothers were evaluated in terms of asymptomatic status or predominant symptoms (fever, cough, sore throat, and breathlessness), complication if any including need for ventilatory support for extensive pneumonia, or mortality. Neonates were tested for presence of infection by RT-PCR test on day 2 & 5 of delivery, and also looked for any symptoms of the disease or its complication.

**Results:** Total 33 women with Covid19 positivity delivered at term pregnancy in the said period of 6 months. The most frequent (45.45%) age group was 26 to 30 years. Asymptomatic Covid 19 positive cases were more (57.58%) prevailing over symptomatic patients. Fever was most frequent (33.33%) physical symptom. Emotional quotient was significantly affected by presence of anxiety amongst 36.36%. Caesarean delivery conducted maintaining all protocol in 60.6% women, but all were indicated for other obstetric reason. None of the mother had developed significant pneumonia or other complication. One case of maternal mortality noted, but was not related to Covid 19 infection. Vertical transmission was nil in our study and no neonate was affected by any complication.

**Conclusion:** Course of disease was not different in pregnant women infected by Covid 19 virus in late pregnancy in comparison to non-pregnant adults. No case of vertical transmission noted, neither any neonatal morbidity nor mortality in present study, shows the importance of following optimum protocol. All pregnant women should be screened for Covid 19 infection in current scenario.

**Key words:** Fetal, Maternal, SARS CoV-2.

## INTRODUCTION

The current corona virus disease (COVID-19) pneumonia pandemic, caused by the Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) has become a major global health threat. Viral pneumonia is thought to be the most common non-obstetric infectious disease during pregnancy, and is associated with high maternal and neonatal morbidity and mortality.<sup>1</sup>

Since its first identification in Wuhan, China, in December 2019, COVID-19 is highly infectious and has spread globally at an accelerated rate with rapid increase in cases and mortality<sup>1</sup>. Physiological changes during pregnancy, such as reduced functional residual volume, diaphragm elevation, and oedema of respiratory tract mucosa, as well as changes in immunity can lead to increased susceptibility to viral infections and infected women can have worsened outcomes.<sup>1</sup> Pregnancy-related immunological and physiological changes can lead to worsening of respiratory infections due to systemic effects on the body. Increased heart rate, oxygen consumption, stroke volume, and decreased pulmonary capacity and functional residual capacity are the main physiological changes in the cardiovascular and respiratory systems during pregnancy that increase the chance of complications of COVID-19 in pregnant women compared to the non-pregnant population.<sup>2</sup> On the other hand, pregnancy is associated with immunosuppression. This situation makes pregnant women more susceptible to infectious diseases.<sup>2</sup>

There is a possibility of vertical transmission of SARS-CoV-2 from mother to fetus and creating significant infections in fetuses and neonates.<sup>2</sup>

Studies have so far shown that the clinical, radiological, and laboratory characteristics of COVID-19 pneumonia in pregnant women are similar to those reported for non-pregnant patients. [3-6]

Health policy changes in countries affected by the pandemic. As Covid-19 is a novel infection continuously evolving clinical management guidelines and uncertainty about the reliability of the results make the findings of these reports

difficult to interpret.<sup>7</sup>

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 were small and the findings were diverse in those studies.

This necessitates us to conduct the present study to assess the fetomaternal outcome among COVID-19 positive women delivered in a Level III covid hospital at Moradabad, Western UP.

## OBJECTIVE

The objective of the study is to determine the fetomaternal outcome among Covid-19 RT-PCR positive women delivered in a Level III covid hospital.

## METHODOLOGY

### Study Design

This is a prospective cohort study done from April 2020 to September 2020 over a period of 6 months.

All Covid 19 RT-PCR test positive pregnant women presented either at labour or with other obstetric causes for termination of pregnancy at Teerthanker Mahaveer Medical college and Research Centre (Government designated level III Covid Hospital) were taken as study subject. The study was conducted in the Department of obstetrics and gynecology. The study population was selected after taking informed written consent. All the study subjects received standard care discharged by Covid care team as defined by government protocol.

Various parameters which were taken into consideration to assess maternal outcome were psychological stress, fever, cough, sore throat, breathlessness, ICU admissions, need for ventilator/BI-PAP support and mortality. Neonatal outcomes were assessed by knowing Covid status of baby tested on 2<sup>nd</sup> and 5<sup>th</sup> day of life, development of fever and pneumonia, need for ventilatory/C-PAP support.

All patients were followed up till their discharge from hospital which varied from time to time as per constantly evolving guidelines by the

designated health committee of the government.

## RESULTS & ANALYSIS

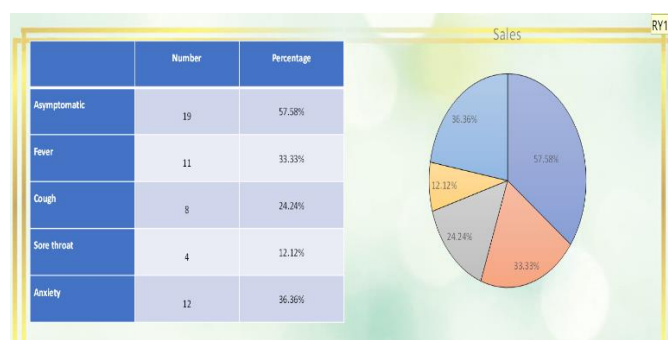
Initially pregnant patients with Covid-19 were scanty as per lower chance of exposure amongst pregnant women due to restricted outdoor activity. Total number of samples was 33 till 30<sup>th</sup> September 2020. All 33 diagnosed Covid 19 positive mothers came with term pregnancy either in labour or for other obstetric condition for need of immediate delivery. As our institution was working as government designated Covid-Care hospital from the very beginning, positive pregnant patients were referred from nearby government as well as private set-ups for deliveries. Out of 33, four patients had hypothyroidism (on medication), two were GDM (on diabetic diet only), and one reported with antenatal eclampsia.

Table 1: Age wise distribution of the study population

Age groups	Number	Percentage
20-25 years	13	39.40%
26-30 years	15	45.45%
More than 30 years	5	15.15%
<b>Total</b>	<b>33</b>	<b>100.0%</b>

Age distribution pattern shows maximum numbers of study population (45.45%) were in 26 to 30 years group. Numbers of pregnancy cases are more in 20 to 30 years of age group in general, so also reflected in our study population (85%).

Table 2: Showing History of exposure and COVID symptoms



All mothers had history of exposure to Covid

positive individuals either in the family or in close contact.

Asymptomatic cases dominated (57.58%) over symptomatic (considering physical symptoms only) cases. Asymptomatic cases were diagnosed by following contact tracing protocol. Fever was most common (33.33%) presenting symptom. Many patients had multiple symptoms.

Table 3: Showing the distribution of Mode of Delivery

Mode of delivery	Number	Percentage
LSCS	20	60.6%
VD	13	39.4%

Table 4: Distribution of complications among study population

Complications	Number	Percentage
Mortality	1	3.03%
Pneumonitis	0	0.0%

Table 3 showing 60.6% mothers were delivered by C section (but all were due to other obstetric indication).

Table 4 shows none of our study population had developed significant pneumonia. One case of mortality noted although not related to SARS CoV2 complication.

None of the neonates tested for SARS-CoV-2 viral nucleic acid on nasopharyngeal and oropharyngeal samples were resulted positive on day 2 and 5 evaluation as per government protocol. None of the babies had developed any sign of fever, pneumonia or any other morbid condition. No mortality noted.

## DISCUSSION

World Health Organisation (WHO) has reported that there is no apparent difference in the risk of developing clinical symptoms between non-pregnant and pregnant women of reproductive age.<sup>8</sup>

Patients most commonly present with mild symptoms of the infection including fever, cough, fatigue, and shortness of breath; however, many of them may be asymptomatic.<sup>3,8</sup>

In a retrospective review by Liu et al, a comparison of 59 patients, which included both pregnant and non-pregnant adults, was carried out. That review reported no significant difference between two groups regarding the development of the clinical features of SARS-CoV-2.<sup>4</sup>

According to one study, pregnancy itself does not worsen the symptoms experienced, or the findings on a CT scan of COVID-19 related pneumonia.<sup>1</sup>

In our study, the most common symptom at presentation was fever among 33.33%, cough among 24.24% and sore throat among 12.1% women. None had developed breathlessness. The majority of the studies have supported the evidence of fever and cough as the most common presenting symptoms.<sup>3,8</sup>

Data from China found severe complications among 8% pregnant women with coronavirus disease (COVID-19).<sup>1</sup>

A prospective cohort study using the UK Obstetric Surveillance System (UKOSS) found fever and cough as common symptoms in pregnant women having COVID-19 and less common symptoms include shortness of breath, diarrhoea, and myalgia.<sup>9</sup>

We have found 57.58% women were asymptomatic Covid positive diagnosed by contact tracing. Lesser morbidity and mortality amongst Covid 19 positive were observed in all categories of patients in India. Study by Smith V et al found the majority of women being asymptomatic and afebrile at presentation.<sup>5</sup>

As reported by *Shah et al*, most common symptoms

at presentation were cough (61.6%) and fever (46.4%). They noted 38.4% of pregnant patients did not present with symptoms, but most of these patients were diagnosed as having COVID-19 infection by intensive field testing and contact tracing during the initial phase of outbreak in India.<sup>6</sup>

Other reported symptom was distressing anxiety among 36.36% of study population. Isolation, lack of knowledge regarding a comparatively new disease with high infectivity, bizarre look of health care professionals (wearing PPE) are some of the explanations for unusual development of significant anxiety.

In our study, among 33 deliveries, LSCS was performed among 60.6% and vaginal delivery among 39.39% women following all protocols. C. sections were done not for Covid positive status in our study, but for other obstetric reason (mainly post-caesarean pregnancy). Study by Muhidin et al reported that the preferred mode of delivery in Covid 19 infected mothers was caesarean section to reduce neonatal infection.<sup>10</sup>

Since there is limited evidence about vertical transmission and vaginal shedding of virus, vaginal delivery in stable patients may be considered.

*Favre et al.* suggested that for every individual patient, vaginal delivery even by induction should be considered. Using instrumental delivery also is preferred to caesarean section to avoid unnecessary surgical complications and maternal exhaustion.<sup>11</sup>

With regard to the mode of delivery, caesarean section was performed in the majority of cases and several authors cited fetal distress as the reason behind the decision.<sup>12,13</sup>

Regarding the perinatal outcomes, most authors did not report any adverse events.<sup>14,15</sup> In our study there was no evidence of vertical transmission. All our study subjects were infected in the later part of pregnancy, might be the explanation for the same. None of the babies had any other morbidity or mortality as evaluated by designated protocol of our study. In contrast, *Zhu et al* reported one neonatal death and a total of 6 admissions to the neonatal intensive care unit (ICU). The first symptom in the newborns was shortness of breath, observed in six neonates. Other initial symptoms were fever, thrombocytopenia accompanied by abnormal liver function, tachycardia, vomiting and pneumothorax in his study.<sup>12</sup>



However, the severity of postnatally acquired disease in the newborn is unknown. A case series of 10 COVID-19 negative neonates born to COVID-19 positive mothers reported fetal distress, premature labor, respiratory distress, thrombocytopenia accompanied by abnormal liver function, and even death among neonates.<sup>6</sup> This may indicate a possible association, but not necessarily a causal effect.

## CONCLUSION

The available data revealed that clinical manifestations of pregnant women infected by SARS-CoV-2 in late pregnancy are similar to those of non-pregnant adults.

At present, there is no evidence regarding the greater risk of pregnant women to succumb to COVID-19 infection and experience severe pneumonia.

Maternal morbidity was evident as cough, fever, sorethroat and anxiety. No evidence of maternal mortality noted due to Covid complication in present study.

There was no evidence of vertical transmission and no fetal morbidity and mortality seen in our study. Following strict protocol at every stage of management of Covid 19 positive mother reduces chances of neonatal infection.

Overall, due to the lack of information on COVID-19 pneumonia in pregnancy, all suspected pregnant women should be systematically screened, monitored and followed up in current scenario.

### Limitations

As novel corona virus infection is a new challenging situation, our study was limited to assess the obvious presentation and immediate outcome. All our samples contacted infection by SARS CoV2 in late pregnancy period, so evaluation of vertical transmission may not be the actual reflection. Long term studies are required to evaluate the all-out effect of Covid-19 infection on maternal as well as fetal health.

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