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Original Research Article

Maternal and perinatal morbidity and mortality in COVID-19 positive obstetrics patients in tertiary care centre

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ABSTRACT

Background: COVID-19 disease had been declared as a public health crisis by WHO by the end of 2019. The effect of SARS-CoV-2 infection on pregnancy including symptoms, disease severity, risk of vertical transmission and perinatal and neonatal outcome have been the subject of research. Preliminary studies showed a fluctuating course of the disease ranging from asymptomatic or mild symptoms to even maternal death. However, recent evidences suggest that effect of COVID-19 infection during pregnancy may not lead to adverse maternal and neonatal outcome.

Methods: In this cross sectional prospective observational study, we analysed 60 pregnant women infected with SARS-CoV-2 and their neonatal outcome, who tested positive for COVID-19 at district hospital, and were referred to Muzaffarnagar Medical College, were enrolled in this study.

Results: The majority 96.7% (58) of these women were asymptomatic with cough being the most common symptom which was present in 3.3% (2) of the women. 24(75%) women developed pneumonitis radiologically, but they were asymptomatic, so intensive care was not required. Along with 76.08% (35) perinatal/neonatal outcomes were observed normal.

Conclusions: In this study we observed that most of the women with COVID-19 were asymptomatic or with mild symptoms. Even though they were asymptomatic, most of the patients showed pneumonitis changes radiologically but still they didn't require any intensive care, had good recovery postpartum and were discharged under satisfactory condition. The neonatal outcome was highly favourable.

Keywords: SARS-Cov 2, COVID-19, Pregnant women, Neonate

INTRODUCTION

A novel coronavirus first emerged in Wuhan, China, in late December of 2019 and rapidly spread to become a global pandemic, later named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), causing an illness known as covid-19.¹ The World Health Organization has declared it as a public health crisis. A global estimate of 10,094,801 human infections, 146,414 deaths, 9,656,883 recovered cases reported worldwide as of December 22, 2020. Coronavirus, belongs to the family Coronaviridae.

Coronaviruses have enveloped virions and contains a single strand of positive sense RNA (ribonucleic acid). it has crownlike, or coronal, appearance due to presence of Club-shaped glycoprotein spikes in the envelope. COVID-19 is highly contagious disease. Respiratory droplets and direct contact is the main route of transmission. It infects both the upper and lower respiratory tract and can cause pneumonia. Spectrum of the diseases range from asymptomatic to symptoms like fever, cough, muscle aches, vomiting, diarrhoea, nasal congestion, loss of taste and smell sensation and can progress to shortness of breath

and complications from pneumonia. It also infects pregnant women but the majority of patient's experience only mild or moderate symptoms than other healthy adults.² Recent evidence from the UK also suggests that COVID-19 positive pregnant women are at no greater risk of developing serious disease.³ Pregnant women who are elderly, overweight, and have pre-existing medical conditions such as hypertension and diabetes, heart disease (congenital or acquired) are at increased risk of developing severe disease. Current evidence suggests that risk of vertical transmission (transmission from a mother to fetus antenatally or intrapartum) is very low or absent.⁴ If it does occur, it appears to not be affected by mode of birth, method of feeding or whether the woman and baby stay together (rooming in).⁵ There has been no significant increase in the incidence of congenital abnormalities reported till date. It has been shown that an approximately three-fold increased risk of preterm birth and also associated with an increased rate of caesarean birth.

METHODS

This was a cross sectional prospective observational study, conducted at Gynae and Obstetric Department, Muzaffarnagar Medical College (MMCH), between July 2020 to January 2021. Statistical Analysis was performed with help of Epi Info (TM) 7.2.2.2 EPI INFO is a trademark of the Centres for Disease Control and Prevention (CDC). Descriptive statistical analysis was performed to calculate the means with corresponding standard deviations (S.D.). Test of proportion was used to find the Standard Normal Deviate (Z) to compare the difference proportions. $p < 0.05$ was taken to be statistically significant. Sixty pregnant women, tested positive for COVID-19 at district hospital, regardless of symptoms or gestational age were referred to our institute for at least 14 days for isolation or for resolution of symptoms, and were enrolled in this study. Both labour and non-labour patients were included in the study. On admission, all routine antenatal testing, Ultrasonography (USG), corona specific testing includes Interleukin-6 (IL-6), C-reactive protein (CRP), D-Dimer and serum ferritin were done. Fetal surveillance was done by modified biophysical profile Non-Stress Test (NST) and Amniotic fluid index (AFI) and subjects were followed -up till delivery. All the recommended guidelines as directed by MoHFW regarding requisite measures including PPE Kits, Gloves, KN-95 masks, goggles and face shields were taken care of in the ward, labour room and operation theatre.

Inclusion criteria

Nasopharyngeal and pharyngeal swabs of the COVID-19 positive pregnant women were taken for sampling with confirmatory diagnosis done with the aid of real-time reverse transcriptase-polymerase chain reaction (RT-PCR) or True Nat method of testing were included for the study.

Exclusion criteria

Pregnant women presenting signs and symptoms similar to that of COVID-19, yet testing negative for RT-PCR/True Nat were excluded.

RESULTS

A study was performed over 60 COVID-19 positive pregnant women. The mean age was 27.3 (20-36) years with 63.3% cases <30 years and 26.7 cases were >30 years. 51.7% (31) cases were unbooked while 48.3% (29) were booked.

Table 1: Demographic Characteristics of the studied subjects.

Clinical characteristics	Number of patients (%)
Age group (years)	
20-24	20 (33.3%)
25-29	24 (40%)
30-34	11 (18.3%)
35-39	5 (8.4%)
Booking status	
Booked	29 (48.3%)
Un-booked	31 (51.7%)
Obstetrics status on admission	
Antenatal	57 (95%)
Postnatal	2 (3.3%)
Abortion	1 (1.7%)
Gestational Age of patient on admission	
<37	19 (32.2%)
≥37	40 (67.8%)
Gravidity	
Primigravida	21 (35%)
Multigravida	39 (65%)
COVID-19 Symptoms	
Asymptomatic	58 (96.7%)
Cough	2 (3.3%)

Majority 96.7% (58) of the cases were asymptomatic, symptomatic cases with cough were 3.3% (2). On the basis of our data, 95% (57) of the cases were Antenatal, while Postnatal and Abortion were 3.3% (2) and 1.7% (1) respectively.

Note: Postnatal cases admitted in the hospital were referred after the delivery outside the hospital. Of the total Antenatal cases 32.3% (19) were <37 weeks, while 67.8%

(40) were >37 weeks POG. Of all the cases observed, Multigravida and Primigravida were 65% (39) and 35% (21) respectively.

Of all the cases NVD and conservative management was given to 15.2% (7) and 21.67% (13) respectively while 1.66% (1) being Incomplete first trimester Abortion, majority 65% (39) being LSCS. Complications such as fetal distress 35.89% (14), scar tenderness 23.07% (9), pre-eclampsia 15.39% (6), post-dated pregnancy 10.25% (4), previous 2LSCS with pain abdomen 7.69% (3), oligohydramnios 5.12% (2), malpresentation (transverse lie) 2.56% (1).

Table 2: Mode of delivery.

LSCS	39 (84.8%)
NVD	7 (15.2%)
Indication for LSCS	
Fetal distress	14 (40%)
Scar tenderness	9 (26%)
Pre-eclampsia	6 (17%)
Postdated pregnancy	3 (8%)
Previous 2LSCS with pain abdomen	1 (3%)
Oligohydramnios	1 (3%)
Malpresentation (Transverse lie)	1 (3%)

Table 3: Treatment provided to the patient.

Antibiotic	60 (100%)
Hydroxychloroquine (HCQ)	35 (58.3%)
Antiviral treatment	25 (41.7%)
Use of steroids	25 (41.7%)
Conservative management only	13 (21.7%)
ICU admission	2 (3.3%)

Table 4: Laboratory findings.

C-Reactive protein normal range: <5 mg/L	
CRP raised	48 (80%)
CRP normal	12 (20%)
Interleukins 6 Normal range: 1.8 pg/ml (13 cases)	
IL-6 range	13 (21.6%)
Chest X-Ray findings (32 cases)	
Pneumonitis	24 (75%)
Normal	8 (25%)

All pregnant postpartum women were administered antibiotics and enoxaparin. 58.3% (35) were given HCQ, 41.7% (25) were given Antiviral drugs, 41.7% (25) were given Steroids. Injection methyl-prednisolone and tablet hydroxychloroquine 400 mg 12 hourly loading dose on day 1 followed by 200 mg 12 hourly for next 4 days and improvement in symptoms were noted. Vitamin C and zinc were also given to all patients. Antiviral Remdesivir was given postpartum. 21.7% (13) were managed conservatively and only 3.3% (2) were ICU admissions.

Appreciable number of pregnant women 80% (48) had heightened CRP levels, while 13 pregnant women upon whom IL6 was performed had abnormal levels of IL6. Patients were shifted to oxygen bed and oxygen saturation (SpO2) was monitored. On chest x-ray examination of 32 pregnant women, 75% (24) presented with pneumonitis, while normal findings were found in 25% (8) women.

Relatively lower number of deaths were observed during treatment 3.3% (2) when compared to 96.7% (58) that were discharged after treatment in good condition. Along with 76.08%

(35) perinatal/neonatal outcomes were observed normal. NICU admission 6.52% (3) was higher than preterm neonates 2.17% (1) and neonatal deaths 2.17% (1). Proportion of IUGR being at 8.69% (4) which was higher than IUDs observed 4.34% (2).

Table 5: Clinical outcomes of the studied subjects.

Maternal and perinatal / neonatal morbidity and mortality	
Normal	35 (76.08%)
IUGR	4 (8.09%)
NICU Admissions	3 (6.52%)
IUD	2 (4.34%)
Preterm	1 (2.17%)
Neonatal death	1 (2.17%)
Clinical outcome	
Discharged	58 (96.7%)
Deaths	2 (3.3%)

DISCUSSION

In this study of 60 cases of pregnant women with COVID-19 infection diagnosed during routine antenatal check-up at district hospital, were referred to our college irrespective of the symptoms and gestational age. FOGSI guidelines also recommends COVID-19 testing should be performed in all the pregnant women even if asymptomatic, presenting in labour or likely to deliver in next 5 days.⁶ Out of these 60, 96.7% (58) were asymptomatic and 3.3% (2) were symptomatic presenting with cough. Studies done by Muhidin et al also concluded that cough and fever were the most common symptoms in COVID 19 positive pregnant women.⁷ In our study, the median gestational age on diagnosis was 37.64, and 32.2 % (19) of the patients were <37weeks POG and 67.8% (40) of the patients were ≥37 weeks POG. Study conducted by Knight et al also had similar findings.⁸ On admission apart from routine antenatal testing, COVID-19 specific tests i.e., CRP and IL6 were sent. Due to the non-availability of IL-6 facility in our centre, IL6 testing was started later and was performed in only 13 cases where IL-6 levels were found to be elevated in all the cases. Elevated C-reactive protein levels were found in 80.0 % (48) cases. In pregnant women with COVID 19, the physiological “silencing” of the Th1

pro-inflammatory response with the relative dominance of Th2 suppresses the inflammatory cascade as compared to non-pregnant subjects therefore hampering the severity of the disease and leading to lower incidence of maternal deaths.⁹ In our study also, despite of raised inflammatory markers, both, maternal and neonatal outcomes were favourable. In a study conducted by Yan et al showed that out of 116 cases, 65.5% (76) cases had been discharged with no maternal deaths.¹⁰ Similarly, in our study, we found favourable outcomes among pregnant women with covid19 infection with maternal mortality being only 3.3% (2). Post operatively on day 2, two patients were admitted in ICU because of worsening of COVID-19 symptoms, both the patients died due to pulmonary embolism. As we know pregnancy is a hypercoagulable state, so monitoring of D-dimer is also necessary.¹¹ A case series study has reported elevated D-dimer in pregnant women with COVID-19 and its association with increased mortality rate.¹² In our study, 75% (24) had radiological diagnosis of pneumonia, out of which only 2 patients died due to worsening of respiratory conditions. A prospective cohort study conducted by

Knight et al also showed that out of 427 pregnant women with confirmed SARS-CoV-2 infection, 10% women required respiratory support and 1% women died.⁸ Hence, it showed that despite having pneumonitis features radiologically, maternal mortality and morbidity rates were low. In our study, 84.8% (39) of neonates were delivered by caesarean section, indications being fetal distress, scar tenderness, pre-eclampsia, post-dated pregnancy, previous 2 LSCS, oligohydramnios and malpresentation. These findings are supported by the UKOSS study, where 59% of women had caesarean births; half of which were because of maternal or foetal compromise. Rest were because of obstetric reasons (example, progress in labour, previous caesarean birth) or maternal request (6%). Out of 46 neonates, only 6.52% (3) were admitted in NICU, 2.17% (1) neonatal mortality occurred, 4.34% (2) intrauterine death occurred due to abruptio and aspiration pneumonitis (Thick Meconium stained liquor)

Limitations

We acknowledge the limitations of this review that a full and comprehensive search would have taken more time than was available. We used limited database in order to conduct this study.

CONCLUSION

In this study we observed that most of the women with COVID-19 were asymptomatic or with mild symptoms. Even though they were asymptomatic, most of the patients showed pneumonitic changes radiologically. Initially symptomatic treatment was started and enoxaparin was given along with antibiotic and antiviral agents. This aggressive treatment given to covid-19 obstetric patients led to less requirement of any intensive care, had good

recovery postpartum and were discharged under satisfactory condition. Even the neonatal outcome was highly favourable. We think our study will be very helpful to carry this research further to combat and win the virus.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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