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Covid19 Pregnancy: A Retrospective Comparative Study

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Abstract

Introduction: COVID-19 is caused by SARS-CoV-2, a member of the genus *Beta coronavirus.* As of March 2021, 11.5 million confirmed cases were reported in India, with 1 lakh 60 thousand deaths so far. Pregnant women with risk factors like overweight, hypertension and diabetes have an increased risk of developing severe COVID-19 disease which may lead to adverse fetomaternal outcome.**Aim and objectives:** To compare the fetomaternal outcome among COVID -19 positive and negative pregnant women.**Material and methods:** This is a retrospective observational study done at a tertiary care institute Jharkhand. All laboratory confirmed COVID-19 positive (215) pregnant women admitted between 1st April 2020 to 28th February 2021 were included in the study, while control group (215) was randomly selected from labour room. **Result:** Out of 215 women 112 (52.09%) were asymptomatic at time of admission and were admitted for quarantine. 4(1.86%) women presented with severe symptoms. Mean age was 26.09 ± 5.12 years in COVID positive group and was similar to that of COVID 19 negative who had a mean age of 25.32 ± 4.96 years. Parity was comparable between two groups. There were 18(11.11%) preterm neonates in COVID 19 positive group where as there were 33(18.03%) p value was significant (p=0.035). In COVID positive group 93(43.25%) underwent LSCS where as in COVID 19 negative group 82(38.13%) underwent LSCS. On comparing the mode of delivery it was statistically highly significant (p = 0.000).**Conclusion:** There is no evidence to suggest that there is significant difference in fetomaternal outcome due to COVID 19. Further study with higher sample size is required. Outcomes need to be further studied among women getting infected with newer strains.

Keywords: SARS-CoV-2, COVID 19, fetomaternal outcome.

Introduction

COVID-19 is caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), a member of the genus *Beta coronavirus[1]*. Transmission of SARS-CoV-2 is primarily from person to person via respiratory droplets. Mean incubation period is of 5.2 days. The Novel corona virus was first detected in Wuhan City, Hubei province, China in December 2019. On 11 March, the WHO declared COVID-19 a pandemic[2].SARS-CoV-2 use the same system of cell entry, which is triggered by binding of the viral spike (S) protein to angiotensin-converting enzyme 2 (ACE2) on the surface of the host cell[3].The tissue localization of the receptors correlates with COVID-19 presenting symptoms and organ dysfunction. Real time reverse transcriptase polymerase chain reaction assay (RT-PCR) is the current gold standard for detecting SARS-Cov 2[7].As of March 2021,11.5 million confirmed cases are reported in India, with 1 lakh 60 thousand deaths so far.

Due to physiological and anatomical changes associated with pregnancy pregnant women are more prone to develop serious complications women with risk factors like obesity,hypertension, diabetes, chronic kidney disease,HIV,malignancy are particularly vulnerable to developing severe COVID-19 disease. Some studies suggest that due to relative immunosuppression in pregnancy, intense inflammatory response

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due to COVID 19 leading to severe ARDS may not develop in pregnant women[9].Although some studies suggest increased incidence of preterm delivery, nicu admission, neonatal mortality, prolonged hospitalization,increased maternal morbidity and mortality there is very little understanding regarding the effect of COVID 19 on pregnancy and fetal and maternal outcome. This study aims to compare the adverse fetomaternal outcomes in COVID 19 positive and negative pregnant women which would help to substantiate or refute previous studies regarding effect of COVID 19 on pregnancy and its outcome.

Aims And Objectives

To compare fetomaternal outcome in pregnant women who had tested positive for COVID 19(SARS-CoV-2) with pregnant women who had tested negative.

Material And Methods

It was retrospective observational study done at Rajendra institute of medical sciences, Ranchi, a tertiary care institute which is a designated as integrated COVID Centre for COVID 19 patients.

All COVID-19 positive pregnant women admitted for quarantine and management between 1st April 2020 to 28th February 2021 were included in the study, for control group every 5th pregnant women who were tested COVID negative were randomly selected from labour room during same time period.

According to ICMR guidelines testing was done for all the pregnant women who came in OPD ≥ 36-week gestational age and all women who were admitted in labour room and patients who were tested positive by following three methods were included in our study.

1 RTPCR
2 True -NAT
3 Rapid antigen tests

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Management of women with SARS-Cov 2 infection in pregnancy

Most women presented with mild illness and were admitted for quarantine during this period. They were started on prophylactic azithromycine, vit C and zinc, calcium and vit D. Patients with moderate illness were given oxygen support and nebulisation. Patients with severe symptoms of COVID pneumonia who had abnormal fetal heart tracing or women who did not improve and requirement of ventilator support was anticipated or needed proning were taken for immediate termination of pregnancy by induction or cesarean section according to gestational age. A dedicated operative room was available in the COVID unit for delivery and cesarean section. Neonates were not routinely tested for COVID 19 except who had serious respiratory symptoms and were admitted in NICU. Exclusive breastfeeding was allowed for all neonates with universal precaution where mother and neonates were asymptomatic or had mild to moderate symptoms. Data collected from records included age, parity, antenatal checkups, complications during antenatal , intrapartum and post partum period, mode of delivery and maternal mortality. Perinatal outcome included gestational age, mean birth weight, IUGR, NICU admission, stillbirth and perinatal mortality. Data also included onset of symptoms to hospital admissions, severity of COVID 19 based on requirement of oxygen support and life support equipment (high flow oxygen, NIV and ventilator), vitals at admission, laboratory tests and length of hospital stay. As it was an observational study, medical records of patients were reviewed after taking approval from medical record department and institute medical ethics committee.

Statistical analysis

All the data from record were captured in the questionnaire prepared by the study team. The data entered in Microsoft excel and then further analysis was done in SPSS version 19(IBM, Armonk, NY, USA).The quantitative data was expressed in mean, SD and qualitative data was expressed in proportion and percentage. If any comparison between further groups needs to be done, then appropriate tests of significance was applied for further analysis.

Results

During the period of study between 1st April 2020 to 28th February 2021, 215 COVID 19 positive pregnant women were admitted and in this institute, out of which 47 patients were discharged without delivery. In control group 215 women were selected out of which 13 women were discharged without outcome.

Clinical presentation at the time of admission in COVID19 positive women

Out of 215 women 112 (52.09%) were asymptomatic at time of admission and were admitted for quarantine. 4(1.86%) women presented with severe symptoms (shortness of breath) rest were admitted for management of mild to moderate illness e.g. 50(23.2%) women had fever;32 (14.8%) had cough; 60 (27.9%) had vague symptoms like headache, loss of taste and smell, loss of appetite, diarrhoea and fatigue.

Baseline characteristic of two groups

On comparison of baseline characteristics of COVID 19 positive and negative women mean age was 26.09 ± 5.12 years in COVID positive group was similar to that of COVID 19 negative which who had a mean age of 25.32 ± 4.96 years. Out of 215 COVID 19 positive women 120(55.8%) came from rural areas as compared to 95 (44.18%) came from urban areas however among COVID 19 negative women 156(72.5%) came from rural population where as 59(27.4%) came from urban areas. Among the COVID19 positive group 6(2.79%) had GDM 27(12.5%), PIH, 6(2.79%) had cardiac disease in COVID19 2(0.93%);27(12.5%) had PIH; 3(1.39%) had cardiac disease. On comparison it was not statistically significant. Parity and gestational at the time of admission were similar.

Table 1: Baseline characteristics

Category	Covid positive (n=215)(%)	Covid negative(n=215)(%)	P value
Age(mean)	26.09±5.12 yrs	25.32±4.96yrs	0.004
rural	120 (55.8%)	156 (72.55%)	0.0002*
urban	95 (44.18%)	59 (27.44%)	0.003
primigravida	78 (36.27%)	88 (40.93%)	0.0014
multigravida	104 (48.37%)	100 (46.51%)	0.452
booked	158 (73.48%)	179 (83.25%)	0.0060
unbooked	57 (26.51%)	36 (16.74%)	0.029

Comparison in maternal outcome: The maternal outcomes of COVID 19 positive and negative groups were compared. It was observed that the mean gestational age at the time of admission was 30.36 ± 5.65 weeks in COVID positive women as compared to 31.6 ± 5.65 in COVID negative women. Among COVID 19 positive women 162(75.3%) delivered where as 183 (85.11%) women delivered among COVID 19 negative, p value was significant (p=0.0123). In COVID positive group 69(32.09%) women delivered vaginally and 93(43.25%) underwent LSCS where as in COVID 19 negative group 101(46.97%) delivered vaginally whereas 82(38.13%) underwent LSCS. On comparing the mode of delivery it was statistically highly significant (p=0.000).There were 4(1.86%) maternal deaths in COVID 19 positive group but were not attributable to COVID related complications there 2(0.93%) maternal deaths in COVID 19 negative group. The mean duration of hospital stay was 10.06 ± 3.17 days in COVID 19 positive women whereas it was 3.88 ± 1.97 in COVID 19 negative, on comparing the p value was significant(p=0.03) as summarized in Table 2.

Table 2: Comparison of maternal outcome

Category	Covid positive (n=215) (%)	Covid negative(n=215)(%)	p value
Gestational age	30.36± 5.65 weeks	31.6± 5.65weeks	
delivered	162 (75.3%)	183 (85.11%)	0.0123
undelivered	47 (21.86%)	19(8.83%)	0.000*
Early preg hemorrhage(abortion, molar, ectopic)	6 (2.79%)	13 (6.04%)	0.077
Vaginal delivery	69 (32.09%)	101 (46.97%)	0.000*
LSCS	93 (43.25%)	82 (38.13%)	0.000*
GDM	6 (2.79%)	2 (0.93%)	0.015
PIH	27 (12.5%)	27(12.5%)	1
Cardiac disease	6 (2.79%)	3 (1.39%)	0.70
Previous h/o Tuberculosis	4 (1.86%)	3 (1.39%)	0.321
Maternal death	4 (1.86%)	2 (0.93%)	0.41
duration of hospital stay(mean)	10.06±3.17days	3.88±1.97days	0.03

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Comparison of neonatal outcome: There were 162 neonates in COVID 19 positive group and 183 neonates in COVID 19 negative group. Among COVID19 positive group 136(83.9%) were term and in COVID 19 negative 145(79.23%) were term. On comparison p value was not significant (p=0.362). preterm neonates in COVID negative group and on comparison it was found to be statistically There were 18(11.11%) preterm neonates in COVID 19 positive group where as there were 33(18.03%) significant (p =0.035).

10(6.17%) had IUGR and 12(7.4%)were stillbirth in COVID positive group and 12 (6.5%) IUGR and 19(10.03%) stillbirth in COVID negative group. On comparison it was not statistically significant. On comparing NICU admissions in the two groups 24 (14.8%)neonates from COVID 19 positive group required NICU admission where as in COVID negative 17(9.28%) needed NICU admission. RT-PCR for COVID 19 was not done for all neonates in both groups. Neonatal outcomes have been summarized in Table 3.

Table 3: Comparison of neonatal outcome

Category	Covid positive(n=162)(%)	Covid negative(n=183)(%)	p value
Term	136 (83.9%)	145 (79.23%)	0.362
Preterm	18 (11.11%)	33 (18.03%)	0.035
IUGR	10 (6.17%)	12 (6.5%)	0.66
Stillbirth	12 (7.4%)	19 (10.03%)	0.192
NICU Admission	24 (14.8%)	17 (9.28%)	0.2514
Birth weight(mean)	2030±45 gms	2202.60±47.06 gms	

Discussion

The results of this study are similar to previous studies which do not show any significant variability in feto maternal outcomes between COVID 19 positive and negative pregnant women. Most of the women were asymptomatic or presented with mild illness. Being a dedicated COVID centre most of the pregnant women came for quarantine .Though certain studies claim to have higher incidence of serious maternal COVID 19 infection in women with risk factors like GDM, PIH, cardiac disease the results of our study did not show such difference. Though the maternal mortality was high (1.86%) in COVID 19 positive women as compared to women who were COVID19 negative (0.93%) no deaths were attributable to complications related to COVID 19. Incidence of LSCS was higher in COVID 19 positive group (43.25%) as compared to (38.13%) in COVID 19 negative group, p value was highly significant (p =0.000) this maybe due to difficulty in continuous monitoring of COVID positive women to avoid prolonged exposure of healthcare providers. Average duration of hospital stay in COVID 19 positive women was higher because as per the guidelines during this study home quarantine was not allowed which led to unnecessary prolonged duration of hospital stay. No significant difference was observed in fetal outcomes in this study though there was slightly higher percentage of NICU admission in newborns of women who were COVID 19 positive as there was higher incidence of fetal distress in this group.

Limitations

This was a record based retrospective study, sample size was small duration of study was short. COVID 19 women who were discharged before delivery were not followed up..Further prospective study with larger sample size is required to assess the impact of COVID 19 on fetomaternal outcome.

Conclusion

This study indicates that most of the pregnant women remain asymptomatic or have mild illness following COVID 19 infection and there is no significant difference in the fetomaternal outcomes between the COVID 19 positive and negative women. Further study is required to assess the impact of COVID 19 on pregnancy and its outcome.

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