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FETO-Maternal Outcome in COVID-19 Infected Pregnant Women

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ABSTRACT

Background

WHO has declared SARS-CoV-2 infection as pandemic. Epidemiological evidence shows that viruses has increased risk of severity and mortality during pregnancy. CDC has published that pregnant woman infected with COVID-19 are at risk of severe illness, complications and death. Currently there is not enough evidence on vertical transmission.

Objective

The present study was conducted to evaluate the feto-maternal outcome in COVID-19 infected pregnant women at our institution.

Materials and methods

Pregnant women presenting to our institution with symptoms of COVID-19 were included in this study during the period from May 2020 to May 2021 and they were followed till delivery. The fetal and maternal outcomes were evaluated.

Results

We included 100 pregnant women. The mean age of women was 25.2 ± 2.93 years. The commonest presenting symptoms are Fever, cough, sore throat and shortness of breath. Majority of the women in third trimester (63%) had COVID-19 infection. Prevalence of lower segment caesarean section was seen. There were 3 (3.12%) neonatal deaths. One (1.04%)neonate was found to be COVID-19 positive.

Conclusion

COVID-19 infection had an adverse impact on both maternal, fetal and neonatal outcome, and vertical transmission is seen in one neonate. Third trimester of pregnancy was mostly affected by Covid-19 infection. So all the pregnant women with COVID- 19 should be well informed about the adverse impact of this virus on maternal and neonatal outcome.

Keywords: COVID-19; Virus; SARS-CoV-2 infection; infection in pregnancy.

INTRODUCTION

The SARS-CoV-2 (also known as COVID-19 illness) was declared as a pandemic by the world health Organization. It was first detected in Wuhan, China, in December 2019, and the virus has spread very rapidlly throughout the world, almost to all countries . SARS- CoV-2 is a corona virus, that infect human beings. The major root of infections are Respiratory droplets, close interaction with an infected person, or coming in contact with contaminated surfaces.

The most common presenting symptoms are dry cough, fatigue, fever with other symptoms being loss

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of smell or taste, headache, chills, nasal congestion, conjunctivitis, sore throat, muscle or joint pain, different types of skin rashes, nausea or vomiting, diarrhoea and dizziness.[1] The severity of this disease is less in young patients, while severity is higher with older patients and in those having comorbidities such as diabetes mellitus, cardiovascular disease, hypertension, etc.[1]

There is strong epidemiological evidence that pregnant women are at higher risk of severe illness and mortality from viral infections noticeably during pandemics such as influenza, EBOLA and Lassa fever.[2-5] Furthermore, viral infection may lead to preterm labour and delivery, by infection with other superimposed microorganisms.[3,6,7]

According to Centre for Disease Control and Prevention (CDC) the overall risk of COVID-19 to pregnant women is low; however, pregnancy increases the risk for severe illness and death with COVID-19 infection. Pregnant women infected with COVID-19 are likely to develop complications of respiration, requiring ventilator support.[8]

CDC also affirmed that pregnant women with other co morbidities and higher age can increase the risk of developing severe COVID-19 illness. There is also an increased risk for preterm birth with poor pregnancy outcomes in these pregnant women.[8]

At present the vertical transmission of the covid-19 in pregnancy and the foetus are still unknown . What is known is that no virus samples have been found in the breast milk or in amniotic fluid.[9]

There is also no confirmation regarding the mode of delivery, whether caesarean section should be performed or not. WHO has clarified on this aspect that, caesarean section only be performed, when medically justified.[10]

Gradually, more and more literature on this topic have cameout, but many questions are still unanswered. With so many questions regarding the outcomes of COVID-19 infection in pregnancy, the present study was done to evaluate the feto-maternal outcome in pregnant women infectedwith COVID-19.

MATERIALS & METHODS

The present observational study was conducted in the Department of Obstetrics & Gynaecology, Hi-Tech Medical College,& Hospital, bhubaneswar, Odisha, during the period from May 2020 to May 2021. Hundred pregnant women were included in this study, who have came to the institution during the study period, with signs and symptoms suggestive of COVID-19 infection.

The inclusion criteria were, pregnant women with symptoms and signs appropriate of COVID-19 infection and willing to provide voluntary written informed consent to participate in the study and comply with the study protocol. All the non-willing women were excluded from the study.

All the pregnant women and/or her legally acceptable representative were explained about the study procedures in detail including the risks/benefits, in their own language. They were also informed that it is an observational study and no investigation/special examination/procedure will be done for the specific requirement of the study. All the data relevant to pregnant mother and her child will be collected from the patient files. This is also informed that she can withdraw her consent atany time during the study period.

All the pregnant women included in the study, underwent thorough routine physical and clinical examination. Information regarding maternal age, gestational age, clinical signs and symptoms at the time of admission were noted. All routine investigations complete blood count, urine routine, HBsAg, HIV, HCV, VDRL, coagulation profile,D-dimer, ultrasonography of the abdomen and obstetrics scan, colour doppler, COVID-19 rapid antigen test, SARS-CoV-2 RTPCR test, C-reactive protein, X-ray, and computed tomography of the chest was carried out in each of the pregnant woman. Eight women were provided with shields and explained the risk of exposure of radiations. All These women were treated according to the standard protocol for the management of COVID-19 infection by a physician along with the consultation with the gynaecologist and all thesewomen were regularly followed-up till delivery.

All the relevant data was captured in a customized proforma. The foetal and maternal outcomes formed our outcome measures. The descriptive data was presented in the form ofnumbers and percentages.

RESULTS

In the present study, 100 pregnant women infected with COVID- 19 were included. eight (8%) woman was in the age group of 19- 20 years, 46 (46%) women were in the age groups of 21-25 years and42 (42%) women

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were in the age group of 26-30 years and four (4%) woman was in age group of more than 30 years. The mean age of the women was 25.2 ± 2.93 years.

The most common presenting complain were found to be fever (48%), cough (44%), sore throat (41%), weakness (32%), myalgia (28%), shortness of breath (12%), unconsciousness was seen in 1 (1%) woman. each as presented in **Table 1**.

Presenting complain	Number	Percentage
Fever	48	48
Cough	44	44
Sore throat	41	41
weakness	32	32
myalgia	28	28
Shortness of breath	12	12
Unconscious	1	1
Table 1: Presenting complaints		

There are 46 women (46%) of primigravida and 54 women (54%) of multigravida in our study. 82 percent were admitted in the hospital and 18% had taken treatment on OPD basis.
Thirteen (13%) women presented with COVID-19 infection in their first trimester and 24 (24%) in their second trimesterand 63 (63%) in their third trimester of pregnancy. (**TABLE -2)**

Pregnancy trimester	Number	Percentage
First (up to 12wk)	13	13
Second (13-28 weeks)	24	24
Third (28+ weeks)	63	63
Total	100	**100**
Table 2: Trimester of pregnancy at presentation		

07 pregnant women(7%) was diabetic and 6 (6%) had hypertension, 04 women had anemia, one (1%) women had hypothyroidism, while rest of the women were not having any co-morbidities.

Of these 100 women, 10 (10%) women required ICU admissions. 67 (67%) underwent lower segment caesarean section, 33 (33%) underwent normal vaginal delivery .**Table 3**

Mode of Delivery	Number	Percentage
Lower segment caesarean section	67	67
Normal vaginal delivery	33	33
Total	**100**	**100**
Table 3: Mode of delivery		

Of the 100 women who delivered, 3 (3%) had intrauterine deaths (IUD) , 18 (18%) had preterm birth, ONE (1%) was stillbirth and 78 (78%) were live births (**TABLE -4).**

Pregnancy Outcome	Number	Percentage
Live birth	78	78
Preterm birth	18	18
IUD	3	3
Stillbirth	1	1
Total	100	100
Table 4: Pregnancy outcome.		

At 1 minute, 9 (9.3%) babies had APGAR of 5, 18 (18.7%) baby had APGAR of 6 and 67 (69.7%) babies had APGAR of 7. At 5 minutes, 8 (8.3%) babies had APGAR of 6, 9 (9.3%) babies had APGAR of 7, 13

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(13.5%) babies had APGAR of 8 and 66 (68.7%) babies had APGAR of 9. **TABLE - 5**

Apgar score (at 1 minute)	Number	Percentage	APGAR score (At 5 minutes)	Number	Percentage
5	**9**	**9.3%**	**6**	**8**	**8.3%**
6	**18**	**18.7%**	**7**	**9**	**9.3%**
7	**67**	**69.7%**	**8**	**13**	**13.5%**
			9	**66**	**68.7%**
Table 5: (APGAR score at 1 minute and 5 minutes					

Meconium aspiration syndrome was seen in 8 (8.3%), birth asphyxia in 2 (2.0%), respiratory distress syndrome in 10 (10.4%) of the neonates. **TABLE -6**

Adverse outcome	number	Percentage
Meconium aspiration syndrome	8	8.3%
Birth asphyxia	2	2%
Respiratory distress syndrome	10	10.4%
Table 6: (adverse neonatal outcome)		

COVID-19 infection was seen in 01 (1.04%) neonate and 13 (13.5%) neonates required NICU admission . Neonatal deaths were seen in 3 (3.12%).

Vertical transmission was seen only in one neonate. The first test sample was taken immediately after delivery and next within 48 hours of delivery. Only one neonate was RT-PCR positive.

DISCUSSION

In the present study, we evaluated the foetal as well as maternal outcome in pregnant women who had COVID- 19 infection during pregnancy. We have included 100 such women, and all included pregnant women were followed up till their delivery.

Majority of the women in our study were in the age group 21- 25 years with a mean age of 25.2 ± 2.93 years.

Fever, cough, sore throat, myalgia and weakness and shortness of breath were the most common presenting complains in our study. A meta- analysis by Basnet et al[11] also reported fever, cough, dyspnoea, pneumonia to be the commonest presenting complaints in the covid positive pregnant women.

Majority of women in third trimester came with COVID-19 infection in our study, showing that women in their third trimester are more prone to have severe COVID-19 infection. Our findings are supported by the study done by Salem et al[12] who also reported that third trimester seems to be more vulnerable period of covid-19 infection.

67% of covid-19 pregnant women in our study underwent lower segment caesarean section and 33% undergone normal vaginal delivery, while a review published by Papapanou et al[13] had reported a very high proportion of lower segment caesarean section in these women ranging from 52.3% to 95.8% and vaginal deliveries from 4.2 to 44.7%. Another study by Basnet et al[11] also reported a prevalence of lower segment caesarean section to be 74%, which is similar to our study findings. A retrospective study done by Dogra et al[14] also reported nearly comparable proportion of lower segment caesarean section and normal vaginal delivery, which is not similar with our study findings.

Primigravida (46%)and multigravida(54%) were found in our study. Maternal mortality is not observed in our study. Knight et al[15] in their national cohort reported 1% (5) deaths. Dogra et al14 in their study reported no maternal deaths.

Diabetes (7%), hypertension (6%), anemia (4%), hypothyroidism (1%) were seen in our study group ,rest of them were not having any co-morbidities. Gajbhiye et al[16] in their study reported hypertensive disorders in 10%, diabetes in 9%, hypothyroidism in 3% of patients. Knight et al[15] in their study reported that 34% of their women had pre-existing co-morbidities. We also found similar co-morbidities in our study, though the

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prevalence was less in our study.

Intrauterine deaths were seen in 3%, preterm delivery was seen in 18% women and stillbirth was seen in 1% women in our study. A high prevalence of intrauterine death along with preterm delivery were also reported by Ayat et al[17] who in their study concluded that pregnant women with COVID-19 might have an increased risk of preterm labour, intrauterine fetal death, stillbirth, increase pregnancy related risk, increase foetal and maternal distress. Also study done by Yang et al[18] supported this findings. Their study also concluded that COVID-19 during the later pregnancy is associated with increased risk of preterm birth and caesarean section delivery. Gajbhiye et al[16] in their study reported a very high prevalence of preterm birth (25%) in comparison to our study findings.

In our study only 1 (1.04%) neonate was found to be COVID- 19 positive. So, there is a chance of vertical transmission of this virus. Knight et al[15] in their national population-based cohort study also reported a prevalence of 5%. Dogra et al[14] in their study also reported COVID-19 in one neonate. The results of these two studies14,15 are comparable to our study, while study done by Gajbhiye et al[16] reported a higher prevalence of 8% in their study.

Around 8.3% of our neonates had meconium aspiration syndrome, 2.0% had birth asphyxia and 10.4% had respiratory distress syndrome. Birth asphyxia was reported in one neonate by Dogra et al[14] in their study. In our study, there were 3 (3.12%) neonatal deaths . Dogra et al[14] in their study reported no neonatal deaths. The limitations of this study are that we had included only a small sample of women.

CONCLUSION

The results of our study suggest that there is increased feto-maternal morbidity and mortality with COVID-19 infection. We also found in our study that COVID-19 has a vertical transmission from mother to fetus. COVID-19 has a higher infection rate in third trimester of pregnancy. Neonatal mortality is also higher in infected women. After all Care should be taken while delivering these women as there is an equal chance of COVID-19 infection to the healthcare workers.

So all the pregnant women should be alerted about the adverse fetal and maternal outcomes due to this viral infection.

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Conflict of interest: none

Ethics clearance: as it is a retrospective study, and data obtained for clinical purposes. So our study did not need ethical approval.

REFERENCES

1. Coronavirus disease (COVID-19). Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and answers-hub/q-a- detail/coronavirus-disease-covid-19. Accessed on 02-Aug-2021.
2. Kourtis AP, Read JS, Jamieson DJ. Pregnancy and infection. N Engl J Med 2014; 370(23):2211-8.
3. Kwon JY, Romero R, Mor G. New insights into the relationship between viral infection and pregnancycomplications. Am J Reprod Immunol 2014; 71(5):387-90.
4. Price ME, Fisher-Hoch SP, Craven RB, McCormick JB. A prospective study of maternal and fetal outcome in acuteLassa fever infection during pregnancy. BMJ 1988; 297(6648):584-7.
5. Jamieson DJ, Uyeki TM, Callaghan WM, Meaney-Delman D, Rasmussen SA. What obstetrician-gynecologists should know about Ebola: a perspective from the Centers for Disease Control and Prevention. Obstet Gynecol 2014; 124(5):1005-1010.
6. Romero R, Miranda J, Chaiworapongsa T, Korzeniewski SJ, Chaemsaithong P, Gotsch F, et al. Prevalence and clinical significance of sterile intra-amniotic inflammation in patients with preterm labor and intact membranes. Am JReprod Immunol 2014; 72(5):458-74.
7. Romero R, Espinoza J, Gonçalves LF, Kusanovic JP, Friel L, Hassan S. The role of inflammation and infection in preterm birth. Semin Reprod Med 2007; 25(1):21-39.
8. Pregnant people. Available from: https:// www.cdc.gov/ coronavirus/ 2019ncov/ need- extra-precautions/pregnant-people.html. Accessed on 31-Jul-2021.

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9. Coronavirus disease (COVID-19). Available from: https://www.who.int/news-room/q-a-detail/coronavirus-disease-covid-19-pregnancy- and child birth #:~:text=We%20still%20do%20not%20know, in% 20the%20womb%20or %20breastmilk. Accessed on 31-Jul-2021.
10. Caesarean sections should only be performed when medically necessary says WHO. Available from: https://www.who.int/reproductivehealth/topics/maternal_perinatal/csstatement/en/#. Accessed on 31-Jul-2021.
11. Basnet S. Meta Analysis on Pregnancy and Perinatal Outcomes of Pregnant Women with COVID-19. Molung Educational Frontier 2020; 10:169-80.
12. Salem D, Katranji F, Bakdash T. COVID-19 infection in pregnant women: Review of maternal and fetal outcomes. Int J Gynaecol Obstet 2021; 152(3):291-298.
13. Papapanou M, Papaioannou M, Petta A, Routsi E, Farmaki M, Vlahos N, et al. Maternal and Neonatal Characteristics and Outcomes of COVID-19 in Pregnancy: An Overview of Systematic Reviews. Int J Environ Res Public Health 2021;18(2):596.
14. Dogra P, Sharma B, Sharma S. Clinical profile, maternal and fetal outcome in pregnant women with COVID-19 infection: a retrospective observational study in a tertiary care hospital of Himachal Pradesh. Int J Reprod Contracept Obstet Gynecol 2021; 10(1):228-33.
15. Knight M, Bunch K, Vousden N, Morris E, Simpson N, Gale C, et al. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population based cohort study. BMJ 2020;369 :m2107
16. Gajbhiye RK, Modi DN, Mahale SD. Pregnancy outcomes, newborn complications and maternal-fetal transmission of SARS-CoV-2 in women with COVID-19: A systematic review of 441 cases. BMJ Yale MedRvix 2020.
17. Ayat M, Masoud O, Osman NE, Genedy ASE. Perinatal obstetrical and psychological outcomes among pregnant women with COVID-19. Egyptian Journal of Health Care 2021; 12(2):448-67
18. Yang R, Mei H, Zheng T, Fu Q, Zhang Y, Buka S. Pregnant women with COVID-19 and risk of adverse birth outcomes and maternal-fetal vertical transmission: a population- based cohort study in Wuhan, China. BMC Med 2020; 18(1):1-7.