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Original Research Article

Fetomaternal outcome of pregnancy with COVID-19: a prospective study in a COVID dedicated hospital

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ABSTRACT

Background: Given physiological changes in immunological, pulmonary, cardiac, and coagulation systems during pregnancy, pregnant women have long been recognized as susceptible demographic during infectious disease pandemics. Learning about pregnancy outcomes, possible issues, and neonatal health issues in babies delivered to COVID-19-infected mothers is crucial. Study aimed to analyze fetomaternal outcome of pregnancy with COVID-19.
Methods: This was a prospective longitudinal study done on COVID dedicated to Sylhet Shahid Shamsuddin Ahmed Hospital, from January 2021 to January 2022. A total of 54 pregnant women admitted with confirmed COVID-19 were included in this study as per inclusion criteria.
Results: In this study, most patients were in the 26-33 age group (37.03%), followed by 18-25 age group (33.33%) and 24-40 age group (29.62%). 50% were primigravida. SARS COV-2 infection occurred in 51.85% of pregnant women in the 3rd trimester, 35.18% in the 2nd trimester, and 12.96% in the 1st trimester, 53.7% of patients had a mild case, 9.26% had moderate, and 37.04% had severe symptoms. 12.96% of patients needed ventilation, while 5.56% were in ICU without ventilation but on HFNC. Two patients had 1st-trimester abortion, and three had pre-term delivery. There was one IUFD, ongoing pregnancy in five patients, vaginal delivery in nine patients, and cesarean section in 25 patients. Sepsis occurred in 3.7% of patients, and post-partum hemorrhage in 1.85%. Oxygen was needed for 37.04% of patients with severe pneumonia. Out of 54 patients, 88.88% recovered, and 11.11% died in the hospital. The number of healthy babies was 74.07%, while premature babies were 5.56%, and there were two perinatal deaths.
Conclusions: This study concluded that pregnant women with COVID-19 infection are at increased risk of adverse pregnancy and birth outcomes however, a low risk of congenital transmission, and the neonatal outcome was good. The availability of ICU in critical conditions is needed for better pregnancy outcomes.

Keywords: COVID-19, Fetomaternal outcome, Pregnancy**,** Delivery

INTRODUCTION

Towards the end of 2019, a novel Coronavirus mutation-categorized as severe acute respiratory syndrome coronavirus 2 (SARS-COV-2)-was identified as the cause of a respiratory illness called COVID-19, that suddenly became an epidemic in China, and then intensely spread in many other countries worldwide as a global pandemic.[1] The physiologic and immunologic deviations during pregnancy may result in systemic effects that predispose women towards complications from respiratory infections leading to maternal and fetal mortality and morbidity. Both SARS-CoV and MERS-CoV were known to be related to adverse outcomes in pregnant women with greater mortality rates than the general population.[2] Physiological

and mechanical changes in pregnancy increase susceptibility to infections in general, particularly when the cardiorespiratory system is affected, and encourage rapid progression to respiratory failure in the gravida.[3] The most commonly reported symptoms can be fever, and cough, less common symptoms included fatigue, diarrhea, dyspnea, sore throat, and myalgia. Fever and cough were the most common onset symptoms.[4] However, pregnant women with COVID-19 are more like to develop severe illnesses, compared to both non-pregnant women and pregnant women without COVID-19.[5] Pregnancy outcomes vary by trimester of presentation.[6] The risks of spontaneous abortion and preterm birth may not increase but there is a possibility of vertical transmission when it manifests during the third trimester of pregnancy.[7] General principles regarding the management of COVID-19 during pregnancy include early isolation, aggressive infection control procedures, and testing for co-morbidities. Oxygen therapy as required, avoidance of fluid overload, and prophylactic antibiotics for prevention of superadded bacterial infection are compulsory. If there is respiratory failure early intubation should be done.[8] Women with comorbidities may have an increased risk of severe morbidity and mortality. The cycle threshold signifying the viral load and degree of infectivity can modify management during pregnancy.[9] Since the first cases of coronavirus disease (COVID-19) in pregnancy were discovered, significant concerns have been raised about the potentially increased susceptibility of pregnant women to severe disease, and the unquantified risk of mother-child transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) to the fetus and neonate.[10] Despite a large number of pregnant women with the coronavirus disease 2019 (COVID-19), there is not enough analytical study to compare maternal and fetal consequences of COVID-19 infected with non-infected pregnancies.[11] So, this study aimed to analyze the fetomaternal outcome of pregnancy with COVID-19.

Objective

General objective

General objective were to analyze the fetomaternal outcome of pregnancy with COVID-19.

Specific objectives

Specific objectives were to see the complications in pregnancy associated with COVID-19 and to see the severity of COVID-19 in pregnancy.

METHODS

This was a prospective longitudinal study done on COVID dedicated to Sylhet Shahid Shamsuddin Ahmed hospital, from January 2021 to January 2022. A total of 54 pregnant women admitted with confirmed COVID-19 were included in this study as per inclusion criteria. Informed written consent was obtained from all study subjects. A pre-designed data collection sheet was used to collect the necessary data.

Inclusion criteria

Pregnant women, patients of 18-40 years old, patients with confirmed COVID-19 infection and patients who had given consent to participate in the study were included.

Exclusion criteria

Pregnancy with other complications, patients who did not give consent to participate in the study and patients with chronic diseases were excluded.

Statistical analysis

Statistical analysis of the results was obtained by using statistical packages for social sciences (SPSS-17) software. All data were kept confidential and used only for this study purpose. Ethical clearance was obtained from the ethics committee of Shahid Shamsuddin Ahmed hospital, Sylhet.

RESULTS

Among the study subjects, most (20, 37.03%) of the patients were in the 26-33 years age group, 18 (33.33%) were in the 18-25 years age group, and the rest 16 (29.62%) were in 24-40 years age group (Table 1) 50% were primigravida in this study (Figure 1), 51.85% of pregnant women were infected with SARS COV-2 in 3rd trimester, 35.18% were in 2nd trimester and 12.96% were in 1st trimester (Table 2).

Table 1: Distribution of subjects according to age, (n=54).

Age (Years)	N	Percentages (%)
18-25	18	33.33
26-33	20	37.03
34-40	16	29.62

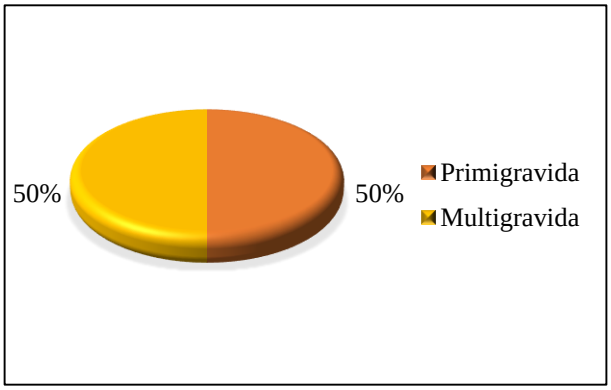

Figure 1: Distribution of respondents according to gravida, (n=54).

Table 2: Distribution of respondents according to exposure to COVID-19 infection in trimesters, (n=54).

Trimesters	N	Percentages (%)
1st trimester	07	12.96
2nd trimester	19	35.18
3rd trimester	28	51.85

Table 3: Distribution of study subjects according to severity, (n=54).

Severity	N	Percentages (%)
Mild	29	53.7
Moderate	05	9.26
Severity	20	37.04

Table 4: Distribution of respondents who needed special support, (n=54).

Severe	N	Percentages (%)
Ventilation (NIV and mechanical)	10	12.96
ICU without ventilation (HFNC)	03	5.56

Table 5: Distribution of patients according to pregnancy outcome, (n=54).

Outcomes	N	Percentages (%)
1st-trimester abortion	02	8.7
Preterm delivery	03	5.56
IUFD	01	1.85
Ongoing pregnancy	05	9.3

Table 6: Distribution of patients according to the mode of delivery, (n=54).

Mode of delivery	N	Percentages (%)
Vaginal delivery	09	16.7
Cesarean section	25	46.3

Table 7: Distribution of patients according to complication, (n=54).

Complications	N	Percentages (%)
Sepsis	02	3.70
PPH	01	1.85
Oxygen needed	20	37.03

According to severity assessment, 29 patients (53.7%) were the mild case, moderate 05(9.26%) and 20 patients (37.04%) were severe (Table 3). In the present study, 10 patients (12.96%) needed ventilation (NIV and also mechanical ventilation). 03 (5.56%) patients were in ICU without ventilation but in HFNC (High flow nasal cannula) (Table 4) 1st-trimester abortion occurred in 2 patients (8.7%). Pre-term delivery occurred in 3 (5.56%) patients. IUFD in 1 (1.85%) patient, ongoing pregnancy in 05 (9.3%) patients (Table 5). Vaginal delivery occurred in 9 (16.67%) patients, and cesarean section was in 25 patients (46.3%) (Table 6). Sepsis occurred in 02 (3.7%) patients and post-partum hemorrhage 1 (1.85%) patients, oxygen was needed for 20 patients (37.04%) in variable amounts for those who had severe pneumonia (Table 7). Out of 54 patients, 48 patients (88.88%) recovered, and 6 patients (11.11%) died in the hospital (Table 8). Regarding fetal outcome, the number of the healthy baby was 40 (74.07%), premature babies were 3 (5.56%) in number, and there was 1 (1.85%) IUFD and 2 (3.7%) perinatal death (Table 9).

Table 8: Distribution of patients according to maternal outcome, (n=54)

Maternal outcome	N	Percentages (%)
Recovered	48	88.88
Died	06	11.11

Table 9: Distribution of patients according to fetal outcome, (n=54).

Fetal outcome	N	Percentages (%)
Healthy baby	40	74.07
Premature	03	5.56
IUFD	01	1.85
Perinatal death	02	3.7

DISCUSSION

Among the study subjects, most (20, 37.03%) of the patients were in the 26-33 years age group, 18 (33.33%) were in the 18-25 years age group, and the rest 16 (29.62%) were in 24-40 years age group with the mean age of 29 years. In another study, the mean age was 27 which was quite similar to this study.[12] In this study, 51.85% of pregnant women were infected with SARS COV-2 in 3rd trimester, 35.18% were in 2nd trimester and 12.96% were in 1st trimester. Similarly, of the 23 pregnant patients, 19 were in their third trimester of pregnancy and were infected with COVID-19 in another study.[13] Concerning severity, 29 patients (53.7%) were the mild case, moderate 05 (9.26%) and 20 patients (37.04%) were severe. However, in another study mild, moderate, and severe cases were 81%, 14%, and 5% respectively.[14] In the present study, 10 patients (12.96%) needed ventilation (NIV and also mechanical ventilation). 03 (5.56%) patients were in ICU without ventilation but in HFNC (High flow nasal cannula). However, 3 women were intubated and mechanically ventilated during pregnancy due to respiratory failure and pneumonia resulting from COVID-19 in another study. They also stated that mechanical ventilation in pregnant women may not necessarily result in high mortality rates 1st-trimester abortion occurred in 2 patients (8.7%), which was similar to another study.[15,16] Pre-term delivery occurred in 3 (5.56%) patients. IUFD in 1 (1.85%) patient, ongoing pregnancy in 05 (9.3%) patients. While 27.3% had preterm delivery according to another study.[17] Vaginal delivery

occurred in 9 (16.67%) patients, and cesarean section was in 25 patients (46.3%). A study showed that the COVID-19 cohort had higher cesarean deliveries (68%) vs (53.3%) in the negative cohort.[18] Regarding complications, sepsis occurred in 02 (3.7%) patients and post-partum hemorrhage in 1 (1.85%) patient. These complications were similar to the findings of another study.[19] Out of 54 patients, 48 patients (88.88%) recovered and 6 patients (11.11%) died in the hospital. Regarding fetal outcome, the number of healthy babies was 40 (74.07%), premature babies were 3 (5.56%) in number, there was 1 (1.85%) IUFD and 2 (3.7%) perinatal death. A study stated that a majority of pregnant women with COVID-19 had mild disease and recovered with good perinatal outcomes which portrayed the same picture as the present study.[9] Similarly, another study showed, severe maternal and neonatal complications were not observed in pregnant women with COVID-19 pneumonia who had a vaginal or cesarean delivery.[20] The clinical characteristics of patients with COVID-19 during late pregnancy are similar to those reported by non-pregnant adults with COVID-19. The maternal, fetal, and neonatal outcomes of those pregnant women infected in late pregnancy appear very good.[21]

Limitations

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

This study concluded that pregnant women with COVID-19 infection are at increased risk of adverse pregnancy and birth outcomes however, a low risk of congenital transmission, and the neonatal outcome was good. The availability of ICU in critical conditions is needed for better pregnancy outcomes.

Recommendation

Once a pregnant woman is a suspected/confirmed COVID-19 infection, maternal care, and childbirth would become complicated and challenging. So, it is essential to standardize screening, admission, and management of all suspected/confirmed pregnant women infected with COVID-19 and prepare maternity wards in the best possible way. Management should be performed by local, and international guidelines, and strategies to quickly implement obstetric units have also been suggested. Moreover, further studies should be conducted involving a large sample size and multiple centers.

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

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