Original Research Article

Impact of COVID 19 on Preterm Rupture of Membrane

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Abstract

Background: The majority of perinatal research on COVID-19 currently focuses on the pregnancy consequences of SARS-CoV-2-infected women, including as cesarean sections, fetal distress, premature delivery, and even maternal mortality. However, it is currently uncertain how the COVID-19 pandemic would negatively affect premature membrane rupture. ***Aim of the Study:*** The aim of this study was to assess the impact of Covid 19 on preterm rupture of membrane. ***Methods:*** This cross-sectional study was conducted in department of obstetrics and gynaecology, Care Medical College Hospital, Dhaka, Bangladesh from 2021 to 2022. Total 100 pregnant women were included in this study. Where group A represented Covid 19 affected (n=50) and group B represented Not affected by Covid 19 (n=50). ***Result:*** In this study, mean age was 30.9 years (SD±8.5 years) in group A and 29.3 years (SD±7.5 years) in group B. Mean gestational age was 37.55 weeks (SD±2.42 weeks) in group A and 36.10 weeks (SD±3.08 weeks) in group B. Both groups had history of preterm delivery (2%), 8% of group A and 4% of group B had history of postpartum hemorrhage, and 22% of group A and 2% of group B had other family members affected. The commonest mode of delivery in both groups; 74% and 62% in group A and group B respectively. 16% in group A and 8% in group B had premature rupture of membranes and 4% in group A and 2% in group B had preterm premature rupture of membranes. Table V shows the neonatal outcome. Neonatal Covid 19 positive was 4% in group A. 18% of group A and 10% of group B were admitted in NICU. Neonatal mortality was 4% in group A and 2% in group B. ***Conclusion:*** Preterm births are more likely to occur in pregnant COVID-19 patients and the disease has an impact on NICU admissions. Premature rupture of membranes at term and preterm are more frequent in patients with COVID-19.
Keywords: Impact, Covid 19, and Preterm Rupture of Membrane.

INTRODUCTION

Premature rupture of membranes, often known as PROM, is the spontaneous release of amniotic fluid caused by the rupture of the fetal membranes before to the onset of labor. Preterm PROM is classified as PREMMAL PROM, whereas term PROM is PREMMAL PROM that develops after 37 weeks of gestation [1]. PROM occurs at about 5% and 10% of pregnancies and 80% of these pregnancies ending in term [2]. Significant morbidity and death among pregnant women and fetuses are associated with PROM. It has been demonstrated to be responsible for between 18 and 20 percent and 21, 4 percent, respectively, of perinatal mortality and morbidity [3, 4]. Sepsis, hypoxia, and pulmonary hyperplasia are the three factors that contribute to fetal mortality in PROM. Infants born with sepsis have a mortality rate four times greater than those born without sepsis and infected pregnant mothers deliver their babies earlier than uninfected ones do [5]. It is well-known that a number of viral infections during pregnancy raise the danger of poor neonatal and mother outcomes [6-8]. The immunological, respiratory, cardiovascular, and

coagulation systems of the baby are significantly affected by maternal physiological changes during pregnancy, and these changes may have a favorable or negative impact on the course of Coronavirus disease-2019 (COVID-19) illness [9]. According to several investigators, two prior SARS and Middle Eastern respiratory syndrome (MERSCoV) epidemics were linked to poor pregnancy and neonatal outcomes [10]. We have reason to assume that pregnant women may be more susceptible to the negative effects of COVID-19 based on our experiences with pregnancies affected by infection with prior coronaviruses. COVID-19 considerably raises the chance of abortion, preterm delivery, stillbirth, intrauterine growth restriction (IUGR), intrauterine mortality, low birth weight, and case fatality, according to preliminary research on pregnant women [11, 12]. The oxygen supply of the fetus may be impacted by maternal COVID-19, which might result in placental insufficiency, IUGR, fetal discomfort, and/or fetal death, according to certain research [13]. Recent epidemiological and clinical research has revealed conflicting findings regarding the effects of COVID-19 on the mother and fetus [14]. Since the start of the COVID-19 or severe acute respiratory syndrome (SARS-CoV-2) epidemic, it has been asserted that pregnant women are more likely to contract a serious infection [15, 16]. Numerous authorities and specialists swiftly released articles offering suggestions, direction, and knowledge to help medical practitioners treat pregnant COVID-19-infected women [17-20]. Pregnant women don't appear to be more seriously impacted than the general population, according to the majority of early reports, many of which came from China, the pandemic's epicenter [15, 21, 22]. These comforting first findings, however, have been refuted by case reports and small case series of pregnant women from the United States, Iran, and South America [23-25]. Instead, they described COVID-19 disease-affected women who needed invasive mechanical breathing, such as extracorporeal membrane oxygenation (ECMO), and even experienced maternal mortality. Given these contradicting results and the possibility that illness severity varies between nations, further research is urgently required, particularly from nations other than China, to ascertain whether or not COVID-19 affects premature rupture of membranes. Thus, the aim of this study is to assess the impact of Covid 19 on preterm rupture of membrane.

OBJECTIVE

To assess the impact of Covid 19 on preterm rupture of membrane.

METHODOLOGY

This cross-sectional study was conducted in department of obstetrics and gynaecology, Care Medical College Hospital, Dhaka, Bangladesh from 2021 to 2022. Total 100 pregnant women were included in this study. These patients were divided into two groups where each groups contained 50 pregnant women. Here group A represented Covid 19 affected and group B Not Covid 19 affected. Consent of the patients and guardians were taken before collecting data. After collection of data, all data were checked and cleaned. After cleaning, the data were entered into computer and statistical analysis of the results being obtained by using windows-based computer software devised with Statistical Packages for Social Sciences version 22. After compilation, data were presented in the form of tables, figures and charts, as necessary. Numerical variables were expressed as mean and standard deviation, whereas categorical variables were count with percentage.

Inclusion Criteria
- All age group of pregnant women.

Exclusion Criteria
- Patients transferred to another hospital.
- Patients who did not give consent.

RESULT

Table I shows the demographic and clinical characteristics of the pregnant women. In this study, mean age was 30.9 years (SD±8.5 years) in group A and 29.3 years (SD±7.5 years) in group B. Mean gestational age was 37.55 weeks (SD±2.42 weeks) in group A and 36.10 weeks (SD±3.08 weeks) in group B. Mean systolic blood pressure was 124.7 mm Hg (SD±28.5 mm Hg) in group A and 126.4 mm Hg (SD±32.0 mm Hg) in group B. Mean diastolic blood pressure was 78.5 mm Hg (SD±17.5 mm Hg) in group A and 78.0 mm Hg (SD±19.7 mm Hg) in group B. Mean pulse rate was 93.1 dk (SD±14.3 dk) in group A and 91.4 dk (SD±15.3 dk) in group B. Mean body temperature was 36.4°C (SD±0.4 °C) in group A and 37.1°C (SD±0.37°C) in group B. Table II shows the previous history of the pregnant women. 16% in group A and 12% in group B had history of cesarean delivery, both groups had history of preterm delivery (2%), 8% of group A and 4% of group B had history of postpartum hemorrhage, and 22% of group A and 2% of group B had other family members affected. Table III shows the symptoms of the pregnant women with Covid 19 positive.

The commonest symptoms were fatigue (78%) and cough (68%). The perinatal outcome (table IV) shows that cesarean section was the commonest mode of delivery in both groups; 74% and 62% in group A and group B respectively. 16% in group A and 8% in group B had premature rupture of membranes and 4% in group A and 2% in group B had preterm premature rupture of membranes. The maternal mortality rate was 4% in group A and 2% in group B. Table V shows the neonatal outcome. Mean birth weight of the neonatal in group A was 2656 gram (SD±824 gram) and in group B was 2845 gram (SD±489 gram). In group A, 6% had

Apgar 5 score <7 and in group B, 2% had Apgar 5 score <7. Neonatal Covid 19 positive was 4% in group A. 18% of group A and 10% of group B were admitted in NICU. In both groups, 2% had stillbirth. Neonatal mortality was 4% in group A and 2% in group B.

Table I: Demographic and clinical characteristics of the pregnant women (n=100)

Characteristics	Group A (n=50)	Group B (n=50)
	Mean±SD	Mean±SD
Age	30.9±8.5	29.3±7.5
Gestational age (Weeks)	37.55±2.42	36.10±3.08
Gravidity	4.5 ±3.1	5.0 ±3.4
Parity	3.5±2.9	3.9±2.9
Systolic blood pressure (mm Hg)	124.7±28.5	126.4±32.0
Diastolic blood pressure (mm Hg)	78.5±17.5	78.0±19.7
Pulse rate (dk)	93.1±14.3	91.4±15.3
Body temperature (°C)	36.4±0.4	37.1±0.37

Table II: History of the pregnant women (n=100)

Characteristics	Group A (n=50)		Group B (n=50)	
	n	%	n	%
Previous cesarean delivery	8	16	6	12
History of preterm delivery	1	2	1	2
History of postpartum hemorrhage	4	8	2	4
Other family members affected	11	22	1	2

Table III: Symptoms of the pregnant women with Covid 19 positive (n=50)

Characteristics	Group A (n=50)	
	n	%
Fever	13	26
Cough	34	68
Shortness of breath	17	34
Sore throat	15	30
Fatigue	39	78
Diarrhea	9	18
Anosmia or ageusia	11	22

Table IV: Perinatal outcome (n=100)

Outcome		Group A (n=50)		Group B (n=50)	
		n	%	n	%
Mode of delivery	Vaginal delivery	13	26	19	38
	Cesarian section	37	74	31	62
Premature rupture of membranes		8	16	4	8
Preterm Premature Rupture of Membranes		2	4	1	2
Mortality		2	4	1	2

Table V: Neonatal outcome (n=100)

Outcome	Group A (n=50)		Group B (n=50)	
	n	%	n	%
Birth weight (Gram) (Mean±SD)	2656±824		2845±489	
Apgar 5 score <7	3	6	1	2
Neonatal Covid 19 positive	2	4	0	0
Admitted in NICU	9	18	5	10
Stillbirth	1	2	1	2
Neonatal mortality	2	4	1	2

DISCUSSION

Total 100 pregnant women were included in this study. Where group A represented Covid 19 affected (n=50) and group B represented Not affected by Covid 19 (n=50). In this study, mean age was 30.9 years (SD±8.5 years) in group A and 29.3 years (SD±7.5 years) in group B. In the study of Vizheh M *et al.,* [26], maternal age was 31.19 years (SD±5.in

infected group and 31.15 years (SD±5.77 in non-infected group which is similar to our study. In this study, mean gestational age was 37.55 weeks (SD±2.42 weeks) in group A and 36.10 weeks (SD±3.08 weeks) in group B. In the study of Vizheh M *et al.,* [26] mean gestational age was 36.42 weeks (SD±2.73 weeks) in infected group and 37.21weeks (SD ±1.82 weeks). 16% in group A and 12% in group B had history of cesarean delivery, both groups had history of preterm delivery (2%), 8% of group A and 4% of group B had history of postpartum hemorrhage, and 22% of group A and 2% of group B had other family members affected. In the study of Sentilhes L *et al.,* [27] among 54 pregnant women 6 (15.8%) of Pregnant women with confirmed COVID-19 infection group and 3 (18.8%) pregnant women with suspected COVID-19 infection had history of previous cesarean delivery. The commonest symptoms were fatigue (78%) and cough (68%). In the study of Sentilhes L *et al.,* [27] fourteen (25.9%) had fever, 36 (66.7%) a cough, 22 (40.7%) shortness of breath, 9 (16.7%) 157 digestive disorders, and 20 (37.0%) anosmia or ageusia. The perinatal outcome shows that cesarean section was the commonest mode of delivery in both groups; 74% and 62% in group A and group B respectively. In the study of Li N *et al.,* [28] twenty-two patients (12 confirmed and 10 suspected cases) underwent emergency cesarean delivery because of active labor at the time of admission, and 8 had scheduled cesarean delivery (3 confirmed and 5 suspected cases). In our study, 16% in group A and 8% in group B had premature rupture of membranes and 4% in group A and 2% in group B had preterm premature rupture of membranes. In the study of Pérez OM *et al.,* [28] 15.8% of the Covid 19 positive pregnant women and 9.8% of the healthy group had PROM. 4.5% of the Covid 19 positive group and 2% of the healthy group had PPROM. The maternal mortality rate was 4% in group A and 2% in group B. In the current study, mean birth weight of the neonatal in group A was 2656 gram (SD±824 gram) and in group B was 2845 gram (SD±489 gram). In group A, 6% had Apgar 5 score <7 and in group B, 2% had Apgar 5 score <7. 18% of group A and 10% of group B were admitted in NICU. In both groups, 2% had stillbirth. Neonatal mortality was 4% in group A and 2% in group B. In the study of Pérez OM *et al.,* [28] 2.2% of the affected group and 1.1% of the healthy group had Apgar 5 score <7, 9.3% of the affected group and 2.4% of the non-affected group were admitted in NICU, still born was 1.2% in affected group and 0.1% in non-affected group and neonatal mortality rate was 0% and 0.1% in affected group and non-affected groups respectively. In this study, neonatal Covid 19 positive was 4% in group A. In the study of Vizheh M *et al.,* [26] RT-PCR test results were positive in two newborns (0.8%), one of whom died of necrotizing enterocolitis.

Limitations of the study
In our study, there was small sample size and absence of control for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. The study was conducted at a short period of time. The sampling was retrospective and there was no random allocation, so there is risk of selection bias.

CONCLUSION AND RECOMMENDATIONS
Preterm births are more likely to occur in pregnant COVID-19 patients and the disease has an impact on NICU admissions. Premature rupture of membranes at term and preterm are more frequent in patients with COVID-19. Early diagnosis and proper observation can reduce the risk of preterm rupture of membrane in Covid 19 pregnant women.

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