RESEARCH ARTICLE

Postdated Pregnancy and its Feto-Maternal Outcome during COVID-19 Pandemic: Evidence from a Tertiary Care Hospital in Bangladesh

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Abstract :

Background: The COVID-19 pandemic has had profound effects on healthcare systems globally, potentially impacting various aspects of pregnancy and childbirth. The pandemic and associated factors may have affected certain aspects of pregnancy, including postdated pregnancies. It is reasonable to assume that changes in healthcare practices and individual circumstances may have influenced certain aspects of these pregnancies. This study aims to identify the incidence of postdated pregnancy during the COVID-19 pandemic and to evaluate its feto-maternal outcome. **Materials and method:** This is a cross-sectional observational study conducted from May 2020 to December 2020 among postdated pregnancies admitted to a tertiary care hospital who met the inclusion and exclusion criteria. **Results:** Out of 1,567 obstetric cases,158 (10%) were postdated. The majority (43.8%) of them were in the gestational age group of 40- 40+6 weeks. 64.5% of the mothers had a Bishop score between 4 and 6 on admission, and 64.8% had a reactive CTG. The induction rate was 36.0% and 52.7% of the patients had cesarean deliveries. Most maternal outcomes i.e. 79.0% were uneventful. Thirty-one (28.0%) newborns had an Apgar score of less than seven at 1 minute after delivery. 44.6% of newborns required resuscitation, while 18.0% required SCANU support. **Conclusion:** This study indicates a slightly increased incidence of postdated pregnancy in the study hospital during the pandemic, with similar maternal and neonatal outcomes observed during the pre-pandemic period. The Caesarean section rate was found to be higher among postdated pregnancies and increased incidence of fetal distress requiring proper resuscitation and SCANU support.

Keywords: Postdated pregnancy, Feto-maternal outcome, COVID-19.

SMAMC Journal, 2024; 10(1):29-36

Introduction:

The COVID-19 pandemic has had significant effects on healthcare systems worldwide, potentially impacting various aspects of pregnancy and childbirth. Over 213 million women worldwide become pregnant each year, including 89% in low-resource settings and virtually all of them are at risk of contracting COVID-19[1]. Due to their weakened immune systems, pregnant women

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may be more susceptible to severe or critical diseases associated with COVID-19, particularly pneumonia and respiratory failure. There have been extensive studies on clinical manifestations of patients with COVID-19 infection and treatment monitoring, but studies of pregnant women with COVID-19 infection remains relatively rare. Early data from a meta-analysis of 41 pregnant women with COVID-19 showed that they may be at increased risk of miscarriage, preterm birth, pre-eclampsia, and cesarean delivery, particularly if they are hospitalized with pneumonia[2]. There is still limited knowledge on how the clinical characteristics of pregnant women with COVID-19 infection differ from those of non-pregnant women with COVID-19 infection and the extent to which pregnancy and labor affect COVID-19 symptoms.

During the period of COVID-19, the government took some preventive measures and restricted activities throughout the nation from March 23 to May 30, 2020, where there were some disruptions in service utilization, including antenatal and delivery services for mothers. Furthermore, due to different socioeconomic and cultural factors resulting from COVID-19, hospital utilization for EOC services has decreased dramatically throughout the country. The National Health Information System reported that between January and May 2020, ANC and normal vaginal delivery decreased by 59% and 57%, respectively, throughout the country. A nationwide lockdown, disruption of health-care services, and fear of attending health-care facilities might have affected the well-being of pregnant women and their babies[3].

The adverse effects of the COVID-19 pandemic may have resulted in an increased number of obstetric emergencies. Emerging evidence suggests that rates of stillbirth and preterm birth might have changed substantially during the pandemic[4]. A reduction in health-care-seeking behavior, as well as reduced provision of maternity services, has been suggested as a possible cause[3]. Postdated pregnancy refers to a pregnancy that lasts longer than the estimated due date, typically beyond 40 weeks (280 days) of gestation, calculated from the first day of the last menstrual period. "Post-term pregnancy" and "post-dated pregnancy" are sometimes used interchangeably, although post-term pregnancy refers to a pregnancy that extends beyond the 42 weeks (294 days) of gestation, counting from the first day of the last menstrual period. The exact incidence of postdated pregnancies can vary among different populations and studies. However, it is generally estimated to be around 3% to 17% of all pregnancies while, the frequency of post-term pregnancy is approximately 3–12%[5-7].

The impact of the COVID-19 pandemic on the incidence of postdated pregnancy has not been extensively studied or reported in the scientific literature. However, it's reasonable to assume that the pandemic and associated factors may have influenced certain aspects of pregnancy, including postdated pregnancies, due to potential changes in healthcare practices and individual circumstances. The aim of this study is to identify the incidence of postdated pregnancy in the context of the COVID-19 pandemic and the maternal and fetal outcomes of postdated pregnancy. This information can help prioritize interventions needed to address postdated pregnancy's consequences effectively in these unprecedented times while ensuring healthy maternal and fetal outcomes.

Materials and method:

This cross-sectional observational study was carried out at the Center for Woman and Child Health (CWCH), Dhaka. CWHC is a non-profit and philanthropic 100-bed hospital with a special focus on obstetric and gynecological case management, training, and research. This organization has been promoting normal delivery since its inception. The obstetric and gynecological department is managed by 11 consultants, 13 medical officers, and about 20 nursing staff. There is no

provision for an Intensive Care Unit (ICU) or blood bank. All data for this study was collected from the indoor register, patient admission sheet, follow-up sheet, and operation note. There was no direct involvement by the patient. However, ethical approval for the study was obtained from the hospital's ethical review board.

A total of 112 mothers who have completed 40 weeks of gestational age based on their known last menstrual period (LMP) or calculated from a 1st trimester ultrasound scan was included in this study. Out of 158 postdated pregnancies recorded during the study period, 46 were excluded from the study whose gestational age could not be confirmed due to the unavailability of known LMP and 1st trimester ultrasound scan and who were referred for possible ICU support both before and after delivery. Data were processed and analyzed by computer software, SPSS (Statistical Package for Social Science). Descriptive statistics were presented by frequency, percentage, mean and standard deviation. Inferential statistics were presented by chi-square test.

Results :

From May to December 2020, our hospital reported a total of 1,567 obstetric cases, of which 158 (10%) were postdated. In comparison, in the pre-COVID-19 period of May–December 2019, a total of 2,208 obstetric cases were reported, of which 177 (8%) were postdated.

Nearly three-quarters (74.1%) of postdated mothers were between the ages of 20 and 30, with a median age of 24 years. The majority (43.8%) of the mothers had a gestational age between 40 and 40 weeks and 6 days. More than half (52.7%) of the mothers were multigravidas. 53.6% of mothers received Antenatal Care (ANC) at least once. Among all the postdated mothers, 9.8% had a bad obstetric history (BOH), 3.6% had a history of postdates, and 26.8% had a home trial during this pregnancy (Table 1).

Nearly two-thirds (64.5%) of the mothers had a Bishop score between 4 and 6 on admission, and 64.8% had a reactive Cardiotocography (CTG). Spontaneous labor was held in 33.0% of cases, induction of labor was required for 36.0% of cases, and the remaining 31% of cases were done by caesarean section without any induction. The most commonly used method of labor induction was artificial rupture of membranes (45.0%), followed by prostaglandin (30.0%), sweeping (25.0%), oxytocin (20.0%), and Foley catheter (2.5%) (Table 2). More than half (52.7%) of the patients had cesarean deliveries, and 47.3% had normal vaginal deliveries (Figure 1).

Most maternal outcomes 88 (79%)) were uneventful. The most common maternal complications were postpartum hemorrhage in 15 (13%) cases and perinatal tear in 8 (7%) cases. One maternal death was reported. No significant association was found between maternal outcomes and mode of delivery (Table 3).

The mean birth weight of the newborns was recorded to be 2.9 ± 0.395 kg, with 14 (12.5%) babies weighing less than 2.5 kg. Thirty-one (28%) newborns had an Apgar score of less than 7 at 1 minute after delivery, and 10 (9%) had an Apgar score of less than 7 at 5 minutes after delivery. Fifty-six (50%) newborns were born meconium-stained. Fifty (44.6%) newborns required resuscitation, while 20 (18%) required Special Care Newborn Unit (SCANU) support. Regarding fetal outcomes, 85 (76%) babies were healthy, 17 (15.2%) were sick, 1 (0.9 %) had congenital anomalies, and 3 (2.7%) stillbirths, 2 (1.8%) neonatal deaths, and 4 (3.6%) intrauterine deaths (IUD) were reported (Table 4).

Table 1: Characteristics of the postdated mothers (n=112)

Parameters	Frequency (f)	Percentage (%)
Age Group		
< 20 years	15	13.4
20 to 30 years	83	74.1
> 30 years	14	12.5
Median (IQR)	**24 years (7.0)**	
Gestational Age (W=Weeks, D=Days)		
40W - 40W6D	49	43.8
41W - 41W6D	39	34.8
≥ 42 W	24	21.4
Gravidity		
Primigravida	53	47.3
Multigravida	59	52.7
ANC done (at least once)	60	53.6
Any Bad Obstetric history (BOH)	11	9.8
Previous history of Postdated Pregnancy	4	3.6
Home trial in current pregnancy	30	26.8

Table 2: Clinical parameters of the postdated mothers

Parameters	Frequency (f)	Percentage (%)
Bishop's score on admission (n= 110)		
4-6	71	64.5
> 6	39	35.4
CTG (n= 105)		
Reactive	68	64.8
Non-Reactive	37	35.2
Onset of labor		
C-Section without any induction	35	31.0
Spontaneous	37	33.0
Induced	40	36.0
Induction done by(n= 40; multiple response)		
Artificial rupture of membranes (ARM)	18	45.0
Sweeping	10	25.0
Prostaglandin	12	30.0
Oxytocin	8	20.0
Foley's catheter	1	2.5

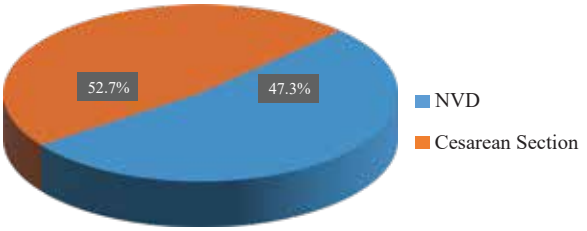

Figure 1: mode of delivery

Table 3: Association of maternal outcome with mode of delivery (n=112)

Maternal outcome	Mode of delivery				p value
	Normal Vaginal Delivery (NVD) (n=53)		Caesarean section (n=59)		
	n	%	n	%	
Uneventful	42	79.2	46	78.0	0.869
Postpartum hemorrhage	5	9.4	10	16.9	0.243
Perineal tear	5	9.4	3	5.1	0.372
Death	1	1.9	0	0.0	0.289

Chi-square test was done and p values < 0.05 was considered statistically significant.

Table 4: Characteristics of neonates (n=112)

Characteristics	Frequency (f)	Percentage (%)
Weight (kg)		
< 2.5 kg	14	12.5
>2.5 kg	98	87.5
Mean (±SD)	2.9 (±0.395)	
Median (IQR)	3 (0.6)	
APGAR score at 1st minute		
0-6	31	28.0
7-10	81	72.0
APGAR score at 5th minute		
0-6	10	9.0
7-10	102	91.0

Fetal distress		
Meconium stain present	56	50.0
Resuscitation needed	50	44.6
SCANU support needed	20	18.0
Outcome of baby		
Healthy	85	76.0
Sick baby	17	15.2
Stillbirth	3	2.7
Neonatal death	2	1.8
Congenital Anomaly	1	0.9
Intra Uterine Death (IUD)	4	3.6

Discussion :

From May to December 2020, a total of 1567 obstetric cases were reported in this hospital, of which 158 (10%) were postdated. The exact incidence of postdated pregnancies can vary among different populations and studies. It is generally estimated to be around 3% to 17% of all pregnancies[5,6]. A cross-sectional study conducted in a tertiary care hospital in Bangladesh found the prevalence of postdated pregnancy to be 15.5%[8].

In a retrospective study on postdated pregnancy conducted by Lata et al. in a academic institute in India also found the incidence of postdated pregnancy as 9.22%[9]. However, the incidence found in this study is within the standard range, though a slight increase was observed in the study hospital compared to the same period in the previous year. We found that almost three-quarters of patients belonged to the age group 20 to 30 years, while the median age was calculated as 24 years. Studies conducted in a tertiary care hospital in Bangladesh found that 60% of postdated pregnancy cases were in the age group of 20–30 years[8,10]. Studies conducted in India found similar results where majority of the postdated pregnancy were among mothers belonging to the 20–30 age group[11-16]. Paliulytė V et al. studied the age distribution among pregnancies beyond 41 weeks of gestation and found no relationship[17].

According to the current study, 43.8% of mothers had gestational ages ranging from 40 weeks to 40 weeks and 6 days. Kandalgaonkar and Kose reported that the majority (69.8%) of the study participants were included in the gestational age group of 40 to 40+6 week[15]. Dobariya PV et al. found that maximum patients were within 41 to 42 weeks12. In a study done by Patel N et al. found that the maximum number of patients (69.8%) were between 40 and 40 weeks [6] days, which is similar to our study[13].

The current study showed that more than half (52.7%) of patients were multigravida. This finding is consistent with other studies conducted in different regions [8.10.11.15].

This study found that 53.6% of postdated mothers received at least one ANC visit, 9.8% of mothers had any bad obstetric history, 3.6% had a previous history of postdates, and 26.8% of mothers conducted a home trial in their current pregnancy. Muhaidat et al18 reported a significant increase in the percentage of pregnant women who did not receive ANC during the pandemic (from 4% to 59.5%). Kandalgaonkar and Kose also reported that 12.5% of mothers were unregistered[15]. In a prospective observational single-center study conducted during the COVID-19 pandemic found that one-third of women had inadequate antenatal visits. The main reason for delayed health-seeking was lockdown and fear of contracting infection, resulting in 44.7% of pregnancies with complications[19]. The present study found that nearly two-thirds (64.5%) of postdated pregnancies had a Bishop's score within 4-6 on admission, which is an unfavorable score indicating a greater likelihood of induction failure and which may ultimately increase the caesarean section rate. Kandalgaonkar and Kose observed that a poor Bishop's score is associated with failure of induction and lesser chances of vaginal delivery. In the present study, spontaneous onset of labor occurred in 33.0% of cases, and induction was needed in 36.0% of

Regarding type of induction, the majority (45.0%) of patients needed ARM, 30.0% needed prostaglandin, 25.0% needed sweeping, 20.0% needed oxytocin, and 2.5% needed foley's catheter. A systematic review and meta-analysis of 16 studies reported that labor induction at 41 weeks' gestation for otherwise uncomplicated singleton pregnancies reduces caesarean delivery rates[20]. Another recent meta-analysis reported that induction of labor at term or post-term reduces the caesarean section rate by 12% and also reduces fetal death[21]. In this study, we found that more than half 59 (52.7%) of the patients had caesarean sections, and 53 (47.3%) had normal vaginal. Chowdhury et al., in their study on pregnancy with COVID-19, found that 80.8% underwent a caesarean section[22]

In this study, the majority of the maternal outcomes were uneventful 88 (79%). The main maternal complications recorded were postpartum hemorrhage 15 (13%), perineal tear 8 (7%) and one maternal death. Regarding perineal tear and PPH, the study conducted in India had mixed findings[11,13,15]. Khalil A et al. reported that there were no significant differences in major maternal outcomes during the COVID-19 pandemic period compared to the pre-pandemic period[4].

In this study, the mean birthweight of the newborns was recorded as 2.9 ± 0.395 kg, with 14 (12.5%) babies weighing less than 2.5 kg. Thirty-one (28%) newborns had an Apgar score of less than 7 at 1 minute after delivery, and 10 (9%) had an Apgar score of less than 7 at 5 minutes after delivery. Among the neonates, meconium stain was present in 56 (50%) of cases, resuscitation was needed in 50 (44.6%), and SCANU support was needed in 20 (18%) cases. Regarding fetal outcome, overall, 85 (76%) babies were recorded as healthy, while 17 (15.2%) were sick, 3 (2.7%) stillbirths, 2 (1.8%) neonatal deaths, 1 (0.9%) congenital anomaly, and 4 (3.6%) intrauterine deaths (IUD) were reported. Delays in the induction of postdated pregnancies during the pandemic may contribute to increased risks of fetal distress and meconium-stained amniotic fluid. A study conducted in a tertiary hospital in Lucknow showed that the rates of resuscitation, MAS, birth injury, and neonatal intensive care unit admissions were 25.3%, 4.0%, 3.3%, and 26.7%, respectively.[23] Tim A. Bruckner et al. found a slight increase in the risk of infant mortality for births in the 41st and particularly the 42nd week of gestation.[24]

Conclusion:

This study indicates a slightly increased incidence of postdated pregnancy in the study hospital during the pandemic, with identical maternal and neonatal outcomes observed during the pre-pandemic period. The caesarean section rate was found to be higher among postdated pregnancies. This study found an increased frequency of fetal distress in postdated pregnancies requiring proper resuscitation and SCANU support during the COVID-19 period.

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