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Short-Term Perinatal Outcomes Among Fasting and Non-Fasting Pregnant Women During Ramadan Periods

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Abstract **Original Research Article**

Background: Ramadan fasting is widely practiced among Muslim pregnant women despite religious exemptions during pregnancy. Concerns remain regarding the possible effects of prolonged fasting on maternal health, fetal growth and neonatal outcomes. Existing evidence regarding the impact of Ramadan fasting on pregnancy outcomes remains inconsistent, particularly in South Asian populations. Limited data are available from Bangladesh regarding short-term perinatal outcomes among fasting pregnant women. This study aimed to assess short-term perinatal outcomes among fasting and non-fasting pregnant women during Ramadan. ***Methods:*** This prospective observational study was conducted in the Department of Obstetrics and Gynecology, Ad-din Momin Medical College Hospital, South Karaniganj, Dhaka, Bangladesh, from February to May 2026. A total of 60 pregnant women between 28 and 40 weeks of gestation were enrolled and divided equally into fasting and non-fasting groups. Maternal demographic characteristics, maternal clinical outcomes and neonatal outcomes were collected using a structured data sheet. Statistical analysis was performed using SPSS version 26.0. ***Results:*** Mean maternal weight gain during Ramadan was significantly lower among fasting mothers compared to non-fasting mothers (1.3±0.7 kg vs 1.8±0.8 kg; p=0.014). Weight gain below 1 kg was more common among fasting mothers (36.7% vs 16.7%; p=0.048). Mean birth weight was slightly lower in the fasting group (2.89±0.36 kg vs 2.97±0.41 kg), although the difference was not statistically significant (p=0.428). Rates of low birth weight, preterm birth, NICU admission and low Apgar score were comparable between groups. ***Conclusion:*** Ramadan fasting during pregnancy was associated with reduced maternal weight gain but was not significantly associated with adverse short-term perinatal outcomes among healthy pregnant women.

Keywords: Ramadan fasting, pregnancy, perinatal outcome, birth weight, neonatal outcome.

INTRODUCTION

Ramadan fasting is one of the five fundamental pillars of Islam and is observed annually by millions of Muslims worldwide. During the month of Ramadan, Muslims abstain from food and drink from dawn to sunset. Although pregnant women are exempted from fasting according to Islamic law, many women still choose to fast because of religious beliefs, family influence and social expectations [1]. Consequently, fasting during pregnancy remains a common practice in many Muslim-majority countries, including Bangladesh.

Pregnancy is associated with substantial physiological and metabolic adaptations that support fetal growth and maternal health. Prolonged fasting during pregnancy may alter maternal glucose metabolism, increase lipolysis and induce ketone production, which could potentially affect fetal development and neonatal outcomes [2,3]. Maternal nutritional status during pregnancy has an important role in fetal growth, placental development and birth outcomes. Therefore, concerns have been raised

regarding the possible impact of Ramadan fasting on maternal and neonatal health.

Several studies have evaluated the relationship between Ramadan fasting and pregnancy outcomes, but findings remain inconsistent. Some studies reported no significant adverse effect of Ramadan fasting on birth weight, gestational age, or neonatal wellbeing [4,5]. Kavehmanesh and Abolghasemi observed that maternal fasting during Ramadan did not significantly influence neonatal birth weight or immediate neonatal outcomes [5]. Similarly, Gul *et al.,* reported no significant difference in perinatal outcomes between fasting and non-fasting pregnant women [6]. Systematic reviews and meta-analyses have also suggested that Ramadan fasting may not substantially affect birth weight or preterm delivery in healthy pregnancies [7,8].

In contrast, other studies suggested that prolonged fasting during pregnancy may contribute to reduced maternal weight gain, altered fetal growth parameters and increased maternal fatigue [9,10]. Dikensoy *et al.,* demonstrated changes in maternal biochemical markers and fetal development during Ramadan fasting [10]. Rezk *et al.,* also reported transient effects on fetal well-being parameters among fasting mothers [11]. Nutritional deprivation and long fasting hours may influence maternal cortisol levels, placental circulation and fetal metabolic adaptation, especially during the later stages of pregnancy [12].

The effect of fasting may vary according to gestational age, duration of fasting, maternal nutritional status, climate and sociocultural practices. Most available studies were conducted in Middle Eastern, Turkish, or Western populations, while evidence from South Asian countries remains relatively limited. Bangladesh is a Muslim-majority country where Ramadan fasting during pregnancy is commonly practiced despite medical exemptions. However, locally generated evidence regarding the short-term perinatal outcomes of fasting pregnant women remains scarce.

Understanding the effects of Ramadan fasting during pregnancy is clinically important for obstetricians and healthcare providers in counseling pregnant women regarding fasting practices and maternal nutrition. Reliable evidence is necessary to guide antenatal counseling and to reduce unnecessary anxiety among pregnant women who wish to fast during Ramadan.

Therefore, the present study was conducted to assess short-term perinatal outcomes among fasting and non-fasting pregnant women during Ramadan at a tertiary care hospital in Bangladesh.

MATERIALS & METHODS

This prospective observational study was conducted in the Department of Obstetrics and Gynecology, Ad-din Momin Medical College Hospital, Dhaka, South Karaniganj, Bangladesh, from February 2026 to May 2026. The study aimed to evaluate short-term perinatal outcomes among fasting and non-fasting pregnant women during the Ramadan period. Pregnant women attending the antenatal outpatient department and admitted to the obstetric unit during the study period were considered as the study population. A total of 60 pregnant women in the third trimester of pregnancy (28–40 weeks of gestation) were enrolled purposively and divided into two groups according to fasting practice during Ramadan: fasting group (n=30) and non-fasting group (n=30).

Inclusion Criteria

1. Pregnant women aged 18–40 years.
2. Singleton pregnancy.
3. Gestational age between 28 and 40 weeks.
4. Women willing to participate in the study.
5. Women with regular antenatal follow-up.
6. Women observing Ramadan fasting for at least 7 days.
7. Non-fasting pregnant women during Ramadan.

Exclusion Criteria

1. Multiple pregnancy.
2. Known chronic hypertension.
3. Pre-existing diabetes mellitus.
4. Other Medical disorders
5. Severe anemia.
6. Pregnancy with congenital fetal anomalies.
7. Intrauterine fetal growth retardation diagnosed before enrolment.

Data Collection Procedure

Data were collected prospectively using a structured and pretested data collection sheet prepared according to the objectives of the study. Eligible pregnant women attending the antenatal outpatient department and obstetric ward during the Ramadan period (19 February to 20 March), fasting duration approximately 12 hours were approached consecutively and informed about the study procedures. After obtaining informed verbal consent, detailed demographic, obstetric and clinical information was collected through face-to-face interviews and review of antenatal records. Participants were categorized into fasting and non-fasting groups based on their fasting practices during Ramadan. The number of fasting days was also documented among fasting mothers.

Maternal variables including age, parity, body mass index, educational status, residence, antenatal visits, gestational age, maternal weight gain and pregnancy-related complications were recorded. Clinical examination findings and antenatal ultrasonography reports were reviewed when necessary to ensure data accuracy. Maternal outcomes such as gestational hypertension, gestational diabetes mellitus, mode of

delivery, maternal fatigue, dehydration symptoms and preterm delivery were documented.

Neonatal outcomes were assessed immediately after delivery by reviewing delivery records and neonatal assessment reports. Neonatal variables included birth weight, Apgar score at 5 minutes, low birth weight, small for gestational age, neonatal jaundice and NICU admission. Standard hospital protocols and calibrated instruments were used during clinical assessment and neonatal measurements to maintain consistency and reliability of data collection.

All collected information was checked daily for completeness and consistency by the principal investigator. Confidentiality and privacy of the participants were maintained throughout the study by using anonymous identification numbers and restricting access to the collected data.

Statistical Analysis

Collected data were entered, cleaned and analyzed using Statistical Package for Social Sciences (SPSS) version 26.0. Continuous variables were expressed as mean ± standard deviation and compared using an independent sample t-test. Categorical variables were presented as frequency and percentage and analyzed using the Chi-square test or Fisher's exact test where appropriate. A p-value less than 0.05 was considered statistically significant.

RESULTS

Table 1: Baseline socio-demographic and obstetric characteristics of the study participants (N=60)

Variables	Fasting Group n (%) (n=30)	Non-Fasting Group n (%) (n=30)	p-value
Maternal age (years), Mean ± SD	26.8 ± 3.9	27.1 ± 4.1	0.772
Age group 20–24 years	10 (33.3)	9 (30.0)	0.932
Age group 25–29 years	14 (46.7)	15 (50.0)	
Age group ≥30 years	6 (20.0)	6 (20.0)	
Urban residence	18 (60.0)	16 (53.3)	0.602
Higher secondary education and above	19 (63.3)	17 (56.7)	0.598
Multigravida	17 (56.7)	15 (50.0)	0.602
Second trimester during Ramadan	18 (60.0)	17 (56.7)	0.796
BMI (kg/m²)	24.1 ± 2.8	24.6 ± 3.1	0.516
≥4 antenatal visits	24 (80.0)	22 (73.3)	0.542

Table 1 presents the baseline socio-demographic and obstetric characteristics of the study participants. The mean maternal age was comparable between fasting and non-fasting mothers (26.8±3.9 vs 27.1±4.1 years; p=0.772). Most participants belonged to the 25–29 years age group in both groups. Urban residence, educational status, parity, body mass index and antenatal care attendance were also similar between groups, with no statistically significant differences observed.

Table 2: Maternal clinical outcomes among fasting and non-fasting pregnant women during Ramadan (N=60)

Variables	Fasting Group n (%) (n=30)	Non-Fasting Group n (%) (n=30)	p-value
Maternal weight gain during Ramadan (kg)	1.3 ± 0.7	1.8 ± 0.8	0.014
Weight gain <1 kg	11 (36.7)	5 (16.7)	0.048
Gestational hypertension	2 (6.7)	3 (10.0)	0.64
Gestational diabetes mellitus	3 (10.0)	4 (13.3)	0.688
Maternal fatigue/dehydration symptoms	8 (26.7)	3 (10.0)	0.095
Reduced fetal movement	4 (13.3)	2 (6.7)	0.389
Caesarean section	11 (36.7)	12 (40.0)	0.793
Preterm delivery (<37 weeks)	3 (10.0)	2 (6.7)	0.64

Table 2 describes maternal clinical outcomes among fasting and non-fasting pregnant women during Ramadan. Mean maternal weight gain during Ramadan was significantly lower among fasting mothers compared to non-fasting mothers (1.3±0.7 kg vs 1.8±0.8 kg; p=0.014). Weight gain below 1 kg was more frequent among fasting mothers (36.7% vs 16.7%; p=0.048). The frequencies of gestational hypertension, gestational diabetes mellitus, reduced fetal movement, caesarean delivery and preterm birth were comparable between the two groups.

Table 3: Neonatal and short-term perinatal outcomes among fasting and non-fasting groups (N=60)

Variables	Fasting Group n (%) (n=30)	Non-Fasting Group n (%) (n=30)	p-value
Birth weight (kg), Mean ± SD	2.89 ± 0.36	2.97 ± 0.41	0.428
Low birth weight (<2500 g)	5 (16.7)	4 (13.3)	0.718
Apgar score <7 at 5 minutes	2 (6.7)	1 (3.3)	0.554
NICU admission	3 (10.0)	2 (6.7)	0.64
Small for gestational age	4 (13.3)	3 (10.0)	0.688
Neonatal jaundice	3 (10.0)	2 (6.7)	0.64

Table 3 shows neonatal and short-term perinatal outcomes among fasting and non-fasting mothers. Mean birth weight was slightly lower in the fasting group, although the difference was not statistically significant (2.89±0.36 kg vs 2.97±0.41 kg; p=0.428). Low birth weight, low Apgar score at 5 minutes, NICU admission, small for gestational age and neonatal jaundice were comparable between groups. No stillbirth or neonatal death was observed in either group.

Table 4: Association between duration of fasting and selected perinatal outcomes among fasting mothers (n=30)

Variables	Fasted <15 days n (%) (n=12)	Fasted ≥15 days n (%) (n=18)	p-value
Birth weight (kg), Mean ± SD	2.98 ± 0.31	2.83 ± 0.38	0.258
Low birth weight (<2500 g)	1 (8.3)	4 (22.2)	0.329
Preterm birth	1 (8.3)	2 (11.1)	0.801
NICU admission	1 (8.3)	2 (11.1)	0.801
Maternal fatigue/dehydration symptoms	2 (16.7)	6 (33.3)	0.316

Table 4 presents the association between fasting duration and selected perinatal outcomes among fasting mothers. Mothers who fasted for 15 days or more had slightly lower mean birth weight and higher frequencies of low birth weight and maternal fatigue symptoms compared to mothers who fasted for less than 15 days. However, none of these differences was statistically significant.

DISCUSSION

The present prospective observational study evaluated short-term perinatal outcomes among fasting and non-fasting pregnant women during Ramadan. The findings demonstrated that Ramadan fasting during pregnancy was associated with lower maternal weight gain during the fasting month, while most maternal and neonatal outcomes remained comparable between fasting and non-fasting mothers.

In the present study, the mean maternal age was 26.8±3.9 years among fasting mothers and 27.1±4.1 years among non-fasting mothers. Most participants belonged to the 25–29-year age group. Similar maternal age distributions were reported by Gul *et al.,* who observed that the majority of fasting pregnant women were in their mid to late twenties [6]. Comparable demographic findings were also reported by Petherick *et al.,* in the Born in Bradford cohort study [13]. These similarities suggest that the study population reflects the reproductive age group commonly observed among pregnant women practicing Ramadan fasting.

The current study found significantly lower maternal weight gain among fasting mothers compared to non-fasting mothers (1.3±0.7 kg vs 1.8±0.8 kg; p=0.014). Additionally, weight gain below 1 kg was significantly more frequent among fasting mothers. These findings are consistent with the observations of Karateke *et al.,* who reported reduced maternal weight gain during Ramadan fasting [9]. Dikensoy *et al.,* also demonstrated metabolic and biochemical changes among fasting pregnant women, suggesting altered maternal nutritional adaptation during prolonged fasting periods [10]. Reduced daytime caloric intake and dehydration during fasting hours may contribute to diminished maternal weight gain.

Despite reduced maternal weight gain, the present study did not identify a statistically significant difference in mean birth weight between fasting and non-fasting groups (2.89±0.36 kg vs 2.97±0.41 kg; p=0.428). Similar findings were reported by Kavehmanesh and Abolghasemi, who found no significant reduction in neonatal birth weight among fasting mothers [5]. Gul *et al.,* also demonstrated comparable birth weights and neonatal outcomes between fasting and non-fasting women during Ramadan [6]. Furthermore, the systematic review and meta-analysis by Glazier *et al.,* concluded that Ramadan fasting was not significantly associated with reduced birth weight or increased risk of low birth weight [7].

The frequency of low birth weight in the present study was slightly higher among fasting mothers (16.7%) compared to non-fasting mothers (13.3%), although the difference was not statistically significant. Similar trends were observed by Savitri et al., who reported minor variations in neonatal anthropometric measurements

without clinically significant adverse outcomes [14]. Cross *et al.,* also observed no substantial association between Ramadan fasting and term birth weight [15]. These findings suggest that maternal physiological adaptation during pregnancy may help preserve fetal growth despite intermittent fasting.

The present study found no statistically significant difference in preterm delivery between fasting and non-fasting mothers. Awwad *et al.,* similarly reported that Ramadan fasting was not associated with increased preterm birth [4]. Comparable findings were also demonstrated by Hefni *et al.,* and Salleh, who observed no increase in spontaneous preterm labour among fasting mothers [16,17]. Adequate maternal hydration and balanced nutritional intake during non-fasting hours may contribute to maintaining pregnancy continuation until term.

Neonatal outcomes including Apgar score, NICU admission, neonatal jaundice and small for gestational age were also comparable between the two groups in this study. Rezk *et al.,* reported similar neonatal outcomes among fasting and non-fasting mothers despite observing transient changes in fetal wellbeing parameters [11]. Seckin *et al.,* also found no significant difference in neonatal outcomes and fetal sonographic findings associated with maternal fasting [18]. The absence of adverse short-term neonatal outcomes in the present study may indicate that healthy pregnant women can physiologically tolerate Ramadan fasting under appropriate nutritional conditions.

The subgroup analysis according to fasting duration demonstrated slightly lower birth weight and increased maternal fatigue among mothers who fasted for 15 days or more, although these differences were not statistically significant. Boskabadi *et al.,* similarly reported that increasing fasting days did not significantly affect maternal or neonatal outcomes [19]. However, prolonged fasting duration may still contribute to maternal discomfort and reduced caloric intake in susceptible women.

Maternal fatigue and dehydration-related symptoms were more common among fasting mothers in the current study, although the association did not reach statistical significance. Bayoglu Tekin *et al.,* reported evidence of fasting-associated dehydration and changes in maternal renal biomarkers during Ramadan [20]. Mirghani *et al.,* also demonstrated transient alterations in fetal biophysical profile and uterine artery blood flow during maternal fasting [21]. These physiological changes may explain the increased frequency of fatigue symptoms among fasting mothers.

Overall, the findings of the present study support the growing body of evidence suggesting that Ramadan fasting among otherwise healthy pregnant women may not significantly increase the risk of adverse short-term perinatal outcomes. The results are particularly relevant for healthcare professionals involved in antenatal counseling in Muslim-majority countries such as Bangladesh.

Limitations and Recommendations

The study was limited by its small sample size and single-center design. Larger multicenter prospective studies with biochemical and long-term neonatal assessments are recommended to further evaluate the effects of Ramadan fasting during pregnancy.

CONCLUSION

The present study demonstrated that Ramadan fasting during pregnancy was associated with lower maternal weight gain but did not significantly affect short-term perinatal outcomes including birth weight, preterm delivery, NICU admission, Apgar score, or neonatal complications. Most maternal and neonatal outcomes were comparable between fasting and non-fasting mothers. These findings suggest that Ramadan fasting may be relatively safe among otherwise healthy pregnant women when adequate nutritional intake and antenatal care are maintained.

Conflicts of Interest: None.

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