

Maternal and Fetal Outcomes of Pregnancy with Controlled and Uncontrolled Gestational Diabetes Mellitus of 34 Weeks and Above

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Abstract

Background: Gestational diabetes mellitus (GDM) is a common disorder affecting around 7.0% of pregnancies each year. The incidence can be significantly higher in certain minority populations that have an increased predisposition to diabetes.

Objective: To evaluate maternal and fetal outcomes in pregnancies at 34 weeks or later with controlled versus uncontrolled gestational diabetes mellitus.

Methods: This prospective study was conducted in the Department of Obstetrics and Gynaecology at Shaheed Suhrawardy Medical College & Hospital (ShSMCH), Dhaka, from July 2023 to June 2024. A total of 100 women were enrolled, including 50 with controlled GDM and 50 with uncontrolled GDM. Participants were classified into uncontrolled (Group I) and controlled (Group II) GDM cases. Socio-demographic data included age, parity, gestational age, and socio-economic status, while clinical data comprised height, weight, BMI, blood pressure, fetal presentation, and mode of delivery. Statistical analyses were performed using SPSS-22 software.

Result: Multivariate reveals that uncontrolled GDM significantly increases the risk of adverse maternal outcomes. Uncontrolled GDM is associated with higher odds of lower segment cesarean section (LSCS), intrapartum hemorrhage, and postpartum hemorrhage. No significant association is found for urinary tract or wound infections. Regarding fetal outcomes, newborns of mothers with uncontrolled GDM are more likely to require admission to the neonatal intensive care unit (NICU) and resuscitation at birth; however, there is no significant association with low birth weight or preterm birth. These findings underscore the risks posed by uncontrolled GDM.

Conclusion: This study emphasizes that uncontrolled GDM in pregnancies of 34 weeks and above significantly increases the risks of cesarean sections, hemorrhages, and neonatal complications like NICU admission and resuscitation, underscoring the need for proper GDM management.

Keywords: Uncontrolled GDM, maternal, fetal, outcomes, cesarean section, intrapartum hemorrhage, postpartum hemorrhage, NICU admission, neonatal resuscitation

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Introduction

Gestational diabetes mellitus (GDM) is a form of glucose intolerance that develops during pregnancy and generally goes away after delivery. It can present health risks for both the mother and baby and is commonly diagnosed in the second trimester using an oral glucose tolerance test (OGTT). GDM is linked to insulin resistance and disrupted glucose metabolism, making early detection essential for ensuring the well-being of both mother and fetus.¹

The prevalence of gestational diabetes mellitus (GDM) varies globally, with a reported global rate of 14.7% based on the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria. Using this same diagnostic approach, South Asia—including Bangladesh, India, and Sri Lanka—showed the highest pooled prevalence at 11.4%, significantly higher than the global range of 3.6% to 6.0%. In Bangladesh specifically, the overall prevalence of GDM was found to be 35.0%, highlighting a growing public health concern in the region.²

Multiple risk factors contribute to the development of GDM, including older maternal age, a previous occurrence of GDM, obesity, and a family history of type 2 diabetes. Research has also found that a higher pre-pregnancy body mass index (BMI) and certain ethnic groups, such as South Asians, are associated with an elevated risk of GDM.³

GDM is mainly caused by insulin resistance resulting from hormonal changes during pregnancy, such as increased levels of placental lactogen, cortisol, and progesterone. These hormones decrease insulin sensitivity, disrupting glucose metabolism. GDM develops when the pancreas cannot adequately compensate for this insulin resistance. Factors like obesity, older maternal age, and genetic predisposition further contribute to the condition.⁴⁻⁵

Uncontrolled GDM significantly raises the risk of negative maternal outcomes, including preeclampsia, cesarean delivery, and pregnancy-related hypertension. Women with uncontrolled GDM are also at higher risk of developing type 2 diabetes after pregnancy, and

long-term cardiovascular complications are a concern, highlighting the importance of continuous monitoring and proper glycemic control during and after pregnancy. These risks emphasize the importance of early diagnosis and intervention to prevent long-term health issues.^{1,6}

For the fetus, uncontrolled GDM poses serious risks such as macrosomia, preterm birth, and birth injuries linked to excessive fetal growth. Macrosomia often leads to shoulder dystocia and increased rates of cesarean sections. Additionally, newborns face risks like respiratory distress syndrome, hypoglycemia, and the need for neonatal intensive care unit (NICU) admission. In the long term, these infants have a higher likelihood of developing childhood obesity and metabolic conditions like type 2 diabetes later in life.^{2,7}

GDM is an increasing concern in Bangladesh due to its effects on both maternal and fetal health. While controlled GDM can pose risks, uncontrolled GDM greatly increases complications for both mother and baby. Investigating pregnancy outcomes in women with GDM, particularly after 34 weeks of gestation, can help healthcare providers identify the necessary interventions to enhance outcomes and reduce complications in Bangladesh. With this in mind, the study aimed to evaluate maternal and fetal outcomes in pregnancies complicated by controlled and uncontrolled GDM beyond 34 weeks, offering insights for better clinical management.

Materials and Methods

This prospective study was conducted in the Department of Obstetrics and Gynecology at Shaheed Suhrawardy Medical College & Hospital (ShSMCH) among admitted women with controlled and uncontrolled gestational diabetes mellitus (GDM) who presented during the study period. The inclusion criteria were gestational age of 34 weeks or above and a diagnosis of controlled or uncontrolled GDM, while the exclusion criteria included pre-existing diabetes, gestational age below 34 weeks, type 1 diabetes mellitus, urinary tract infections, major chronic diseases such as carcinoma or tuberculosis, and conditions like congestive cardiac failure, renal failure, and advanced liver failure that lead to fluid retention and

proteinuria. Gestational Diabetes Mellitus (GDM) was diagnosed using the 75g Oral Glucose Tolerance Test (OGTT), as recommended by the WHO, IADPSG, and FIGO. Participants were classified into two groups based on their HbA1c levels: Group I (uncontrolled GDM) and Group II (controlled GDM).

A total of 100 women of childbearing age were enrolled, and the necessary permissions were obtained from the authorities at ShSMCH. Data collection involved face-to-face interviews using a pre-designed questionnaire, with informed verbal and written consent secured from all participants. Detailed medical histories and records were thoroughly reviewed, followed by clinical examinations and investigations for GDM diagnosis. Socio-demographic variables included age, parity, gestational age, and socio-economic status, while clinical variables comprised height, weight, BMI, blood pressure, fetal presentation, and mode of delivery. The primary outcome measured was macrosomia (birth weight >4 kg), while secondary outcomes included birth weight above the 90th percentile for gestational age, shoulder dystocia, gestational age at delivery, labor induction, cesarean sections, NICU admissions, low APGAR scores (defined as <7 at 5 minutes), preeclampsia, and perinatal mortality.

Operational definition

Gestational age defined as the number of completed weeks of gestation from the date of last menstrual period.⁸ In this study some patients could not provide with accurate information regarding gestational age. So, additional support was taken by USG done on first half of pregnancy.

Gestational Diabetes Mellitus: It is a type of diabetes that occurs in pregnant women. Having it raises their risk for getting diabetes, mostly type 2, for the rest of their lives. African American, Hispanic/Latin, American Indian, and Native American women have the highest risk.

Gestational diabetes is when a pregnant woman who has never had diabetes tests positive for high blood sugar (glucose) levels. Gestational diabetes affects about 4% of all pregnant women and it is estimated that there are about 135, 000 women who suffer from gestational diabetes per year.⁹ It is typically developed during late pregnancy around the 24th to the 28th week and after the baby is fully formed but still growing larger. Many doctors will typically run a glucose tolerance test around

week 24 of pregnancy to determine if the mother has a higher risk for gestational diabetes.

Hydramnios: As a state where liquor amni exceeds 2000 ml.

As quantitative evaluation of the fluid volume is impractical the most commonly used definitions are by ultrasonogram assessment.

By USG: it is diagnosed when AFI (amniotic fluid index) is more than 25 cm or a single pocket pool >8cm.¹⁰

APH (Ante partum haemorrhage): Bleeding from or into the genital tract after the 28th week of pregnancy but before the birth of the baby.

Gestational hypertension: Defined as a diastolic blood pressure of 90 mm Hg or higher or a systolic blood pressure of 140 mm Hg or more, without proteinuria, arising after 20 weeks of gestation, during labor, or in the puerperium in previously normotensive, non-proteinuric women. It may also present earlier in cases of multiple or molar pregnancies.¹⁰

Pre-eclampsia: Hypertension associated with proteinuria, >0.3 gm/L in 24 hour urine collection or 1+ by qualitative urine examination, after 20 weeks of gestation.¹⁰

Eclampsia: Pre-eclampsia when complicated with convulsion in called eclampsia.¹⁰

IUGR: It is defined as estimated fetal weight at or below the 10th percentile for their gestational age.¹⁰

GDM: Gestational diabetes are a heterogonous group of patients whose disease onset or first reorganization occurs during the present pregnancy.¹⁰

PPH: Any amount of bleeding from or into the genital that following birth of the baby upto the end of the puerpenium which adversely affect the general condition of the patient evidence by rise in pulse, falling blood pressure is called post partum haemorrhage.¹¹

Primary PPH: with in 24 hrs.

Secodary PPH: beyond 24 hrs upto the end of peurperium.

Peurperal sepsis: An infection of the genital tract which occurs as a complication of delivery is termed as peurperal sepsis.

Perinatal characteristics:

Preterm baby: When infant born prior to the 37th completed weeks of gestation.

Statistical analysis: A statistical analysis was carried out using the Statistical Package for Social Sciences version 22.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Mean values of variables were compared between the uncontrolled GDM group and the controlled GDM group using an independent t-test, while categorical variables were analyzed using a chi-square test, and the odds ratio with a 95% CI. Multivariate logistic regression analysis was performed, with p-values <0.05 considered statistically significant.

Results

According to the socio-demographic variables, the majority of patients in Group I (34.0%) were aged 26-30 years, while 17 patients (34.0%) in Group II were aged ≤25 years. The mean age was 28.71±4.96 years in Group I and 27.61±4.86 years in Group II. Most patients were housewives, with 60.0% in Group I and 64.0% in Group II. Thirty-eight percent of patients in Group I were graduates compared to 42.0% in Group II. More than half (52.0%) in Group I and half (50.0%) in Group II came from middle-income families, with no statistically significant difference (p>0.05) between the groups. In terms of general examination, 36.0% of patients in Group I did not receive antenatal check-ups, while 62.0% in Group II did. The mean gestational age was 38.0±1.6 weeks in Group I and 39.0±1.9 weeks in Group II, and the mean BMI was 25.6±3.49 kg/m² in Group I and 22.7±3.2 kg/m² in Group II, with a statistically significant difference (p<0.05). For investigations, the mean fasting blood sugar (FBS) was 7.35±0.59 mmol in Group I and 4.35±0.59 mmol in Group II. The mean 2-hour postprandial blood sugar was 9.76±0.92 mmol in Group I and 5.56±1.40 mmol in Group II. The mean HbA1c was 8.51±0.47% in Group I and 6.9±0.63 mmol in Group II. During the antenatal period, 92.0% of patients in Group I were insulin-dependent, and 8.0% followed diet control. Similarly, in the postnatal period, 88.0% of patients were insulin-dependent, and 8.0% adhered to diet control. A total of 34 and 18 patients were underwent lower segment caesarean section (LSCS) in group I (uncontrolled GDM) and group II (controlled GDM) respectively (p<0.001).

Table 1: Distribution of the study patients by socio demographic variable (n=100)

Socio demographic variable	Group I (n=50)		Group II (n=50)		P Value
	n	%	n	%	
Age (in years)					
≤25	14	28.0	17	34.0	
26-30	17	34.0	16	32.0	
31-35	14	28.0	13	26.0	
>35	5	10.0	4	8.0	
Mean±SD	28.71±4.96		27.61±4.86		^a 0.265 ^{ns}
Range(min-max)	(20-36)		(19-36)		
Occupational status					
Housewife	30	60.0	32	64.0	^b 0.680 ^{ns}
Service holder	20	40.0	18	36.0	
Educational status					
Illiterate	13	26.0	12	24.0	
Primary (SSC)	18	36.0	17	34.0	^b 0.919 ^{ns}
Graduate	19	38.0	21	42.0	
Monthly income					
Low income	15	30.0	12	24.0	
Middle income	26	52.0	25	50.0	^b 0.582 ^{ns}
High income	9	18.0	13	26.0	

Group I= Uncontrolled

Group II = Controlled

ns=not significant

^aP value reached from unpaired t-test

^bP value reached from chi square test

In terms of general examination, 18(36.0%) of patients in Group I did not receive antenatal check-ups, while 31(62.0%) in Group II did. The mean gestational age was 38.0 ± 1.6 weeks in Group I and 39.0 ± 1.9 weeks in Group II, and the mean BMI was 25.6 ± 3.49 kg/m² in Group I and 22.7 ± 3.2 kg/m² in Group II, with a statistically significant difference ($p < 0.05$). For investigations, the mean fasting blood sugar (FBS) was 7.35 ± 0.59 mmol in Group I and 4.35 ± 0.59 mmol in Group II. The mean 2-hour postprandial blood sugar was 9.76 ± 0.92 mmol in Group I and 5.56 ± 1.40 mmol in Group II. During the antenatal period, 46(92.0%) of patients in Group I were insulin-dependent, and 4(8.0%) followed diet control. Similarly, in the postnatal period, 44(88.0%) of patients were insulin-dependent, and 6(12.0%) adhered to diet control. A total of 34 and 18 patients were underwent lower segment caesarean section (LSCS) in group I (uncontrolled GDM) and group II (controlled GDM) respectively ($p < 0.001$).

Table 2: Distribution of the study patients according to pregnancy complication at presentation (n=100)

Present pregnancy complication	Group I (n=50)		Group II (n=50)		P Value
	n	%	n	%	
PIH	15	30.0	11	22.0	0.361 ^{ns}
Polyhydramnios	9	20.0	0	0.0	0.001 ^s
PE	8	16.0	3	6.0	0.110 ^{ns}
Congenital anomaly	5	10.0	0	0.0	0.028 ^s
Macrosomic baby	5	10.0	2	4.0	0.218 ^{ns}
UTI	4	8.0	0	0.0	0.058 ^{ns}
PROM	3	6.0	0	0.0	0.121 ^{ns}

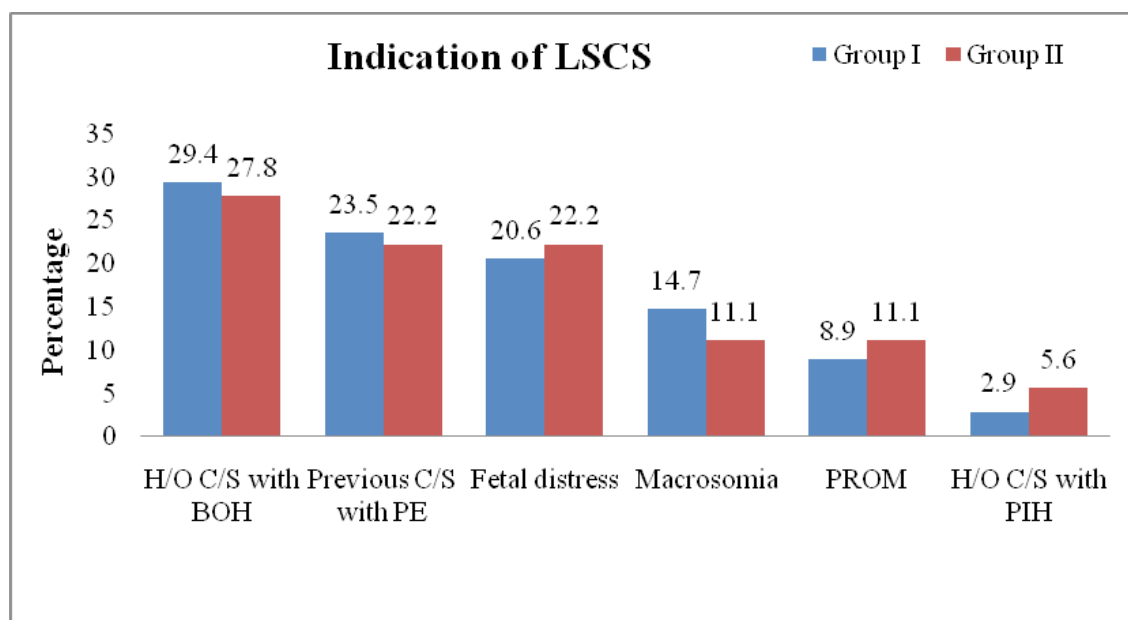


Figure 1: Bar diagram shows the indication of caesarean section of study patients

Table 3: Logistic regression analysis for maternal outcome associated with uncontrolled gestational diabetes mellitus

Maternal outcome	Unadjusted		Adjusted	
	OR (95% CI)	P value	OR (95% CI)	P value
LSCS	3.78 (1.53-9.47)	0.001 ^s	5.14 (1.98-91.83)	0.001 ^s
Intrapartum haemorrhage	9.33 (1.10-100.1)	0.015 ^s	3.46 (1.45-25.07)	0.023 ^s
Primary PPH	8.43 (1.65-57.87)	0.002 ^s	2.14 (2.60-12.52)	0.038 ^s
UTI Infection	1.67 (0.62-4.49)	0.020 ^s	1.83 (1.10-3.34)	0.351 ^{ns}
Wound Infection	0.25 (0.10-0.04)	0.020 ^s	0.12 (0.036-0.43)	0.686 ^{ns}

The logistic regression analysis in the table highlights maternal outcomes associated with uncontrolled gestational diabetes mellitus (GDM) compared to controlled cases for pregnancies of 34 weeks and above. The analysis shows a significant association between uncontrolled GDM and adverse maternal outcomes. Specifically, the odds of undergoing a lower segment cesarean section (LSCS) are significantly higher in uncontrolled GDM cases (Adjusted OR 5.14, 95% CI 1.98-91.83, $p = 0.001$). Similarly, there is a notable increase in the risk of intrapartum hemorrhage (Adjusted OR 3.46, 95% CI 1.45-25.07, $p = 0.023$) and primary postpartum hemorrhage (Adjusted OR 2.14, 95% CI 2.60-12.52, $p = 0.038$). However, for urinary tract infections (UTI) and wound infections, no significant association is observed in the adjusted models ($p > 0.05$). These findings suggest that uncontrolled GDM is associated with a higher risk of certain severe maternal complications during delivery.

Table 4: Logistic regression analysis for fetal outcome associated with uncontrolled gestational diabetes mellitus

Fetal outcomes	Unadjusted		Adjusted	
	OR (95% CI)	P value	OR (95% CI)	P value
Admitted in NICU	5.52 (1.69-19.05)	0.001 ^s	6.63 (1.98-22.18)	0.002 ^s
Resuscitation required	2.70 (1.11-6.66)	0.015 ^s	2.39 (0.91-6.25)	0.041 ^s
LBW	0.42 (0.12-1.34)	0.101 ^{ns}	0.44 (0.14-1.36)	0.154 ^{ns}
Preterm baby	3.44 (0.78-17.31)	0.064 ^{ns}	2.47 (1.04-5.88)	0.076 ^{ns}

The logistic regression analysis for fetal outcomes associated with uncontrolled gestational diabetes mellitus (GDM) in pregnancies of 34 weeks and above reveals significant findings for certain adverse outcomes. Newborns of mothers with uncontrolled GDM are significantly more likely to be admitted to the neonatal intensive care unit (NICU) (Adjusted OR 6.63, 95% CI 1.98-22.18, $p = 0.002$) and to require resuscitation at birth (Adjusted OR 2.39, 95% CI 0.91-6.25, $p = 0.041$). However, there is no significant association between

uncontrolled GDM and low birth weight (LBW) or preterm birth in the adjusted models ($p > 0.05$). These findings indicate that uncontrolled GDM significantly increases the risk of severe neonatal complications requiring immediate medical intervention.

Discussion

Maternal and fetal outcomes in pregnancies affected by gestational diabetes mellitus (GDM) vary significantly depending on glucose control. Controlled GDM is associated with fewer complications, such as preeclampsia, neonatal hypoglycemia, and lower rates

of cesarean delivery. In contrast, uncontrolled GDM increases risks of adverse outcomes, including preterm birth, stillbirth, and neonatal complications such as macrosomia.¹² Early management and maintaining optimal glucose levels are essential in reducing complications for both mother and fetus.¹³

In this study regarding the socio-demographic comparison between uncontrolled GDM (Group I) and controlled GDM (Group II) reveals essential insights into maternal outcomes associated with education, employment, and socio-economic status. The mean age difference (28.71 ± 4.96 years in Group I and 27.61 ± 4.86 years in Group II) is minimal, similar to other studies, which have shown that maternal age may not significantly influence GDM outcomes. A study by Evans et al¹⁴ highlights that other socio-demographic factors, such as income and education, play a larger role in health behaviors and outcomes. Most patients were housewives, with 60.0% in Group I and 64.0% in Group II, aligning with research by Rocheleau et al¹⁵, who noted that employment status could affect lifestyle and health outcomes during pregnancy. Additionally, the slight difference in educational attainment between groups (38.0% of Group I vs. 42.0% in Group II being graduates) resonates with findings from Aslam et al¹⁶, indicating that higher education levels contribute to better health literacy and diabetes management. Furthermore, the lack of significant income differences between the two groups mirrors the findings of Castro et al¹⁷, which suggest that socio-economic disparities have limited influence on GDM outcomes when adequate healthcare access is available.

The significant difference in antenatal check-up rates between Group I (uncontrolled GDM) and Group II (controlled GDM) underscores the importance of antenatal care (ANC) in managing gestational diabetes. Inadequate ANC, as observed in 36% of Group I, can lead to poorer outcomes. Studies, such as those by Mustafa et al¹⁸, confirm that inadequate antenatal visits correlate with worse maternal and fetal outcomes. The lower BMI observed in Group II (22.7 ± 3.2 kg/m² vs. 25.6 ± 3.2 kg/m² in Group I) aligns with findings by Ke et al¹⁹, who demonstrated that lower BMI is associated with better glycemic control and fewer complications. Gestational age also differed, with Group II reaching 39 weeks compared to 38 weeks in Group I, consistent with findings from Yue et al²⁰ on gestational diabetes management.

The comparison of fasting blood sugar (FBS) and postprandial blood sugar between uncontrolled and controlled gestational diabetes mellitus (GDM) reveals notable differences. Group I (uncontrolled GDM) had significantly higher mean FBS levels (7.35 ± 0.59 mmol)

compared to Group II (4.35 ± 0.59 mmol). Similarly, postprandial levels were elevated in Group I (9.76 ± 0.92 mmol). These findings are consistent with studies like Weschenfelder et al²¹, which emphasize the critical role of glycemic control during pregnancy for better outcomes. Additionally, 92% of Group I patients were insulin-dependent during the antenatal period, aligning with Rostin et al²², who explored the predictors of insulin dependency in GDM patients. The significance of these differences underlines the need for close glucose monitoring in GDM management.

The analysis comparing uncontrolled gestational diabetes mellitus (GDM) with controlled GDM in pregnancies of 34 weeks and above demonstrates significant differences in pregnancy complications. Polyhydramnios, significantly higher in the uncontrolled GDM group, was observed in 20% of patients versus none in the controlled group, consistent with prior studies.²³ This association between GDM and polyhydramnios is well-established, indicating the risk of excess amniotic fluid due to poor glycemic control.²⁴ Congenital anomalies, present in 10% of the uncontrolled group, also align with findings from Ghasemzadeh et al²⁵, who noted a strong correlation between GDM and congenital malformations. However, despite higher incidences of other complications such as pregnancy-induced hypertension (PIH), macrosomia, and urinary tract infections (UTI) in the uncontrolled GDM group, no statistical significance was found. Diao et al²⁶ similarly reported an elevated yet non-significant prevalence of PIH in uncontrolled GDM, while Rahman et al²⁷ showed a more direct link between macrosomia and uncontrolled diabetes. These findings emphasize that, while certain complications are closely linked to uncontrolled GDM, others may not reach statistical significance due to sample variability or other influencing factors.

The findings highlight that in both groups of gestational diabetes mellitus (GDM) patients, the most common indication for lower segment caesarean section (LSCS) was a history of caesarean section with bad obstetric history (BOH), affecting 29.4% in the uncontrolled GDM group and 27.8% in the controlled GDM group. Similar trends have been observed in other studies. For instance, in a recent analysis by Garg et al²⁸, BOH remained a prominent reason for LSCS, particularly among high-risk pregnancies with a history of caesarean sections. Pre-eclampsia (PE) was another frequent cause, appearing in 23.5% and 22.2% of patients in the uncontrolled and controlled GDM groups, respectively. A comparison study by Lim et al²⁹ reported similar rates of PE among patients with poor glycemic control, suggesting a consistent relationship between GDM and hypertensive disorders.

Interestingly, fetal distress, a known complication of GDM, was prevalent in both groups, with percentages aligning closely with those reported by Khan et al³⁰, who observed fetal distress in about 21% of their GDM cases. Macrosomia, more associated with uncontrolled diabetes, was seen in 14.7% of Group I and 11.1% of Group II, reflecting findings by Zhang et al³¹, where uncontrolled GDM increased the risk of fetal overgrowth. The overall indications for LSCS were consistent across studies, underscoring the impact of GDM on pregnancy outcomes.

The logistic regression analysis reveals the significant association of uncontrolled gestational diabetes mellitus (GDM) with adverse maternal outcomes, particularly highlighting the higher likelihood of undergoing a lower segment cesarean section (LSCS), intrapartum hemorrhage, and primary postpartum hemorrhage. Studies demonstrate that women with uncontrolled GDM have increased odds of LSCS, which aligns with findings from similar real-world research where cesarean rates are often elevated in GDM cases, particularly when glycemic control is inadequate.³²

Moreover, the association between uncontrolled GDM and increased risk of intrapartum hemorrhage (Adjusted OR 3.46) is comparable to studies where poor glucose control during pregnancy is identified as a risk factor for hemorrhage, although not all studies are conclusive about its strength as an independent factor.³³ The primary postpartum hemorrhage risk (Adjusted OR 2.14) in this analysis is consistent with other findings in the literature that emphasize GDM's role in exacerbating hemorrhage risks, possibly due to factors such as macrosomia and delayed labor progression.³⁴

Interestingly, while urinary tract infections (UTI) and wound infections showed no significant association with uncontrolled GDM in this analysis, contrasting findings exist in the literature. For instance, research highlights the increased susceptibility to UTIs among women with poorly controlled GDM due to immunological alterations during pregnancy.³⁵ Similarly, wound infections have been linked to the heightened risk of infection in the presence of hyperglycemia, yet this study's lack of association could be attributable to varied infection management practices.³⁶

The above findings emphasize the critical role of glycemic control in mitigating the risk of severe maternal complications, aligning with the broader body of evidence regarding adverse outcomes in GDM pregnancies. More extensive research may be required to explore less evident associations, such as with UTIs and wound infections, across different populations.

Multivariate analysis demonstrates that uncontrolled

gestational diabetes mellitus (GDM) is significantly associated with neonatal complications, including a higher risk of NICU admission and resuscitation at birth. These findings align with recent studies which consistently indicate that GDM heightens the risk of adverse neonatal outcomes. Research by Hirsch et al³⁷ identified that neonates of mothers with GDM showed an increased likelihood of NICU admission, with adjusted odds ratios (aOR) similar to this study at around 6.63 (95% CI 1.98-22.18, $p = 0.002$). In another study by Al-Shahrani³⁸ also corroborated these results, emphasizing a rise in NICU admissions among infants of mothers with diabetes, particularly for respiratory complications and the need for resuscitation.

In contrast, there is variability in findings related to low birth weight (LBW). While the present study found no significant association between uncontrolled GDM and LBW, Sunjaya et al³⁹ demonstrated a moderate association between GDM and LBW, with aOR values ranging from 1.78 to 2.05, particularly in cases where mothers had inadequate glycemic control. On the other hand, studies examining preterm birth yielded mixed outcomes. Preda et al⁴⁰ study found a small but significant association between uncontrolled GDM and preterm birth, whereas the current study suggests a non-significant link. These contrasting findings may result from differences in population characteristics, sample sizes, and gestational age cut-offs used in the respective studies. The evidence underscores the critical role of stringent GDM control in mitigating severe neonatal complications, particularly those requiring intensive care and immediate medical intervention.

Limitations

The present study was limited by a short time frame and fund constraints, along with a small sample size. The population was selected from one hospital in Dhaka, which may not reflect the broader situation of the country.

Conclusion

In conclusion, this study highlights the significant maternal and fetal risks associated with uncontrolled gestational diabetes mellitus (GDM) in pregnancies of 34 weeks and above. Uncontrolled GDM is linked to higher rates of lower segment cesarean sections, intrapartum hemorrhage, and postpartum hemorrhage. Fetal outcomes show a heightened risk of NICU admission and resuscitation at birth. However, no significant association was found for urinary tract infections, wound infections, low birth weight, or preterm birth. These findings emphasize the importance of controlling GDM to reduce severe complications during delivery and improve neonatal outcomes.

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