

Impact of Gestational Diabetes Mellitus on Maternal and Neonatal Outcomes in a Tertiary Care Center

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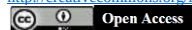
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ABSTRACT

Background: Gestational diabetes mellitus (GDM) is one of the most prevalent medical complications during pregnancy and is linked to a wide variety of adverse maternal and fetal outcomes, especially in tertiary health care facilities where high-risk pregnancies are concentrated.

Objectives: To find out the prevalence of GDM and to compare maternal and neonatal outcomes of women with and without GDM in a tertiary care obstetric unit.

Methods: A cross-sectional study was performed in 119 pregnant women in Iraq (44 women had been diagnosed with GDM according to the IADPSG criteria and 75 women were not diagnosed with GDM). Data included sociodemographic and obstetric history, screening/diagnostic pathway, glycemic parameters, an expanded set of maternal outcomes, and an expanded set of neonatal outcomes to capture the topic from multiple angles. Independent-samples t-tests were used to compare continuous variables, and chi-square tests were used to compare categorical variables. Two multivariable logistic regression models were used to calculate adjusted odds ratios (aOR) for composite adverse maternal and composite adverse neonatal outcomes; glycemic parameters were compared by glycemic control status and by treatment modality within the GDM group, and Pearson correlation was used to examine the relationship between glycemic parameters and birth weight. The p-value was considered statistically significant if <0.05. **Results:** GDM prevalence was 37.0% (44/119). Women with GDM had significantly higher pre-pregnancy BMI (29.3 vs 25.6 kg/m², p<0.001), a higher rate of family history of diabetes (52.3% vs 26.7%, p=0.009), and more previous GDM/macrosomic pregnancies. Pre-eclampsia (25.0% vs 5.3%, OR 5.92, p=0.005), preterm labor (22.7% vs 4.0%, OR 7.06, p=0.004), labor induction (47.7% vs 20.0%, OR 3.65, p=0.003), neonatal hypoglycemia (34.1% vs 8.0%, OR 5.95, p<0.001), and respiratory distress syndrome (20.5% vs 2.7%, OR 9.39, p=0.004) were all significantly more frequent in the GDM group. The composite adverse neonatal outcome (aOR 4.22, 95% CI 1.21–14.68, p=0.024) and composite adverse maternal outcome (aOR 3.09, p=0.055) were significantly associated with GDM on multivariable analysis after adjustment for age, BMI, parity, and either HbA1c or socioeconomic status. In the GDM group, poor glycemic control was significantly associated with macrosomia and neonatal hypoglycemia, and HbA1c (but not single-timepoint glucose values) correlated significantly with birth weight (r=0.36, p=0.016).

In this tertiary care cohort, GDM was significantly linked to a significantly greater burden of adverse maternal and neonatal outcomes, particularly the neonatal pathway, which was most robustly independent of the confounders.

Introduction

Gestational diabetes is a frequent problem during pregnancy that has a negative impact on the course of pregnancy for the mother and the health of the newborn. As of January 1, 2023, 3.42% of the

population was diagnosed with diabetes, of which 92.3% were diagnosed with type 2 diabetes, 5.6% were diagnosed with type 1 diabetes, and 2.1% were diagnosed with other types of diabetes, including 8,758 women with gestational diabetes [1]. Gestational diabetes is a growing problem in recent years and is a major cause of maternal and infant morbidity and mortality [2]. The risks for pregnant women with GD are not limited to preeclampsia, gestational hypertension, polyhydramnios, premature rupture of membranes, and cesarean delivery, but also include a higher risk of developing type 2 diabetes and cardiovascular disease in the future [3]. Women who have had gestational diabetes are especially at risk for developing type 2 diabetes. Gestational diabetes occurs in 8% of pregnancies and is on the rise with the rise in obesity and advanced maternal age [4,5,6]. Women who have had gestational diabetes are 10 times more likely to develop type 2 diabetes than women who have not had gestational diabetes [7]. Overall, the severity of gestational diabetes, maternal obesity, ethnicity, poor nutrition, and low levels of physical activity are predictors of postpartum type 2 diabetes and cardiovascular disease in women [8]. The neonatal period may involve the development of potential complications such as asphyxia, hypoglycemia, hyperbilirubinemia, infectious diseases, respiratory distress syndrome, and birth injuries—including shoulder dystocia and brachial plexus injury [9,10]. There is a clear association between gestational diabetes and hyperglycemia in the offspring. Recent research suggests that maternal hyperglycemia might increase the risk of the disease in the offspring later in life. Many epidemiological studies have demonstrated that the Pima Native American population has the highest prevalence of type 2 diabetes in children and adults. This is supported by the increased risk of obesity, hypertensive disorders, and dyslipidemia in the offspring of mothers with a history of gestational diabetes in later life [11,12,13]. The Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study, a study of the association of hyperglycemia levels with adverse pregnancy outcomes in 10 countries, showed that maternal glucose levels during pregnancy were correlated with higher blood sugar and insulin resistance in the offspring later in life [14,15]. Children of mothers with a history of gestational diabetes have been found to have higher levels of markers of insulin resistance, including HOMA-IR index (Homeostatic Model Assessment for Insulin Resistance), body mass index (BMI), waist circumference, and triglyceride levels. This leads to a higher risk of offspring developing diabetes as they become insulin resistant. It is also estimated that around 20% of children born to mothers who had gestational diabetes will develop type 2 diabetes or prediabetes by age [16].

Methodology

Study Design and Setting

This cross-sectional study aimed to compare maternal and baby outcomes of pregnant women from Iraq with study period 202- 2026 with and without gestational diabetes mellitus (GDM). The study was conducted in the Department of Obstetrics and Gynecology in a tertiary care medical center. This design can be used to measure the prevalence of outcomes (maternal and neonatal complications) and the strength of the association between exposure (GDM)

Study Population and Sample Size

A total of 119 pregnant women admitted for delivery and fulfilling the criteria of the study were recruited consecutively during the study period. The women were divided into two groups: the GDM group (n = 44) made up of women diagnosed with GDM using the IADPSG diagnostic criteria (fasting glucose ≥ 92 mg/dL, 1-hour post-load glucose ≥ 180 mg/dL, or 2-hour post-load glucose ≥ 153 mg/dL); and the non-GDM group (n = 75) made up of women who had normal glucose tolerance on the same test. Based on the results of this analysis, a sample size of 119 participants has sufficient statistical power (more than 80% at $\alpha = 0.05$) to detect medium-to-large effect sizes for the primary maternal and neonatal outcomes compared between the two groups, which is comparable with other single-center, cross-sectional studies of gestational diabetes.

Inclusion and Exclusion Criteria

Inclusion criteria: Singleton pregnancy, gestational age at study entry 28+ weeks, complete pregnancy glucose level test results, delivery at the study center.

Exclusion criteria: Pre-existing (pre-pregnancy) type 1 or 2 diabetes, multiple pregnancy (twins or higher-order multiples), known major fetal congenital anomaly, incomplete medical records.

Data Collection

A structured data collection form was pre-tested in a pilot study, and the data were extracted from prenatal, delivery, and neonatal records. The variables monitored were: maternal sociodemographic characteristics, and anthropometric measurements (age, pre-pregnancy BMI, parity, family history of diabetes); blood glucose indicators (fasting blood glucose, 2-hour postprandial blood glucose, glycated hemoglobin [HbA1c]); management of gestational diabetes (diet/lifestyle vs. pharmacological treatment); maternal outcomes (mode of delivery, pre-eclampsia/pregnancy-induced hypertension, polyhydramnios, preterm birth, postpartum hemorrhage); and neonatal outcomes (birth weight, macrosomia, Large for Gestational Age [LGA], low birth weight, neonatal intensive care unit [NICU] admission, 5-minute Apgar score, neonatal hypoglycemia, respiratory distress syndrome).

Operational Definitions

- Macrosomia: Weight at birth ≥ 4000 g.
- Large for Gestational Age (LGA): Birth weight ≥ 90 th percentile for gestational age (≈ 3900 g for this cohort).
- Low birth weight: Birth weight < 2500 g.
- Good glycemic control (within the gestational diabetes group): HbA1c $< 6.5\%$ in the third trimester; poor control: HbA1c $\geq 6.5\%$.
- Composite adverse neonatal outcome: Presence of at least one of the following: admission to the neonatal intensive care unit (NICU), 5-minute Apgar score < 7 , neonatal hypoglycemia, or respiratory distress syndrome.

Statistical Analysis

SPSS was used to analyse the data. The continuous variables were presented as mean $\pm$ SD and compared between the two groups (gestational diabetes and non-gestational diabetes) by Welch's t-test for independent samples. Categorical (nominal) variables were summarized as frequencies and percentages and compared with the chi-square test (with continuity correction if needed). For binary outcomes, odds ratios (OR) with 95% confidence intervals (CI) were computed, using the Haldane–Anscombe correction. Multivariable binary logistic regression analysis was conducted to calculate the adjusted odds ratio (aOR) for the composite adverse neonatal outcome, adjusting for the following covariates: gestational diabetes status, maternal age, pre-pregnancy body mass index (BMI), parity, and HbA1C level. All analyses were performed with a two-tailed p-value of < 0.05 regarded as significant.

Ethical Considerations

If this protocol should be implemented, approval will be sought from the institutional ethics committee before data collection begins. Individual informed consent requirements will be discussed as per local regulations for retrospective, record-based studies (such as exemption from informed consent if anonymized secondary data is used, or informed consent for a concurrent enrollment mechanism).

Results

Table 1. Sociodemographic and obstetric history

Variable	GDM (n=44)	Non-GDM (n=75)	Statistic	p-value
Maternal age (years)	31.6 ± 3.9	27.0 ± 3.8	t=6.28	<0.001
Pre-pregnancy BMI (kg/m ²)	29.3 ± 4.3	25.6 ± 3.7	t=4.78	<0.001
Gestational weight gain (kg)	10.4 ± 3.5	11.8 ± 2.8	t=-2.22	0.030
Gestational age at booking (weeks)	9.8 ± 2.7	9.6 ± 2.5	t=0.44	0.659
Nulliparous	12 (27.3%)	34 (45.3%)	0.45 (0.20–1.01)	0.079
Education ≤secondary level	32 (72.7%)	27 (36.0%)	4.74 (2.10–10.70)	<0.001
Low/middle socioeconomic status	29 (65.9%)	44 (58.7%)	1.36 (0.63–2.96)	0.556
Family history of diabetes mellitus	23 (52.3%)	20 (26.7%)	3.01 (1.38–6.59)	0.009
Previous pregnancy with GDM	9 (20.5%)	0 (0.0%)	40.41 (2.29–713.90)	<0.001
Previous macrosomic infant	8 (18.2%)	1 (1.3%)	16.44 (1.98–136.55)	0.003
Previous cesarean delivery	4 (9.1%)	8 (10.7%)	0.84 (0.24–2.96)	1.000

Figure 1. Outcomes of the study according to screening pathway by GDM status

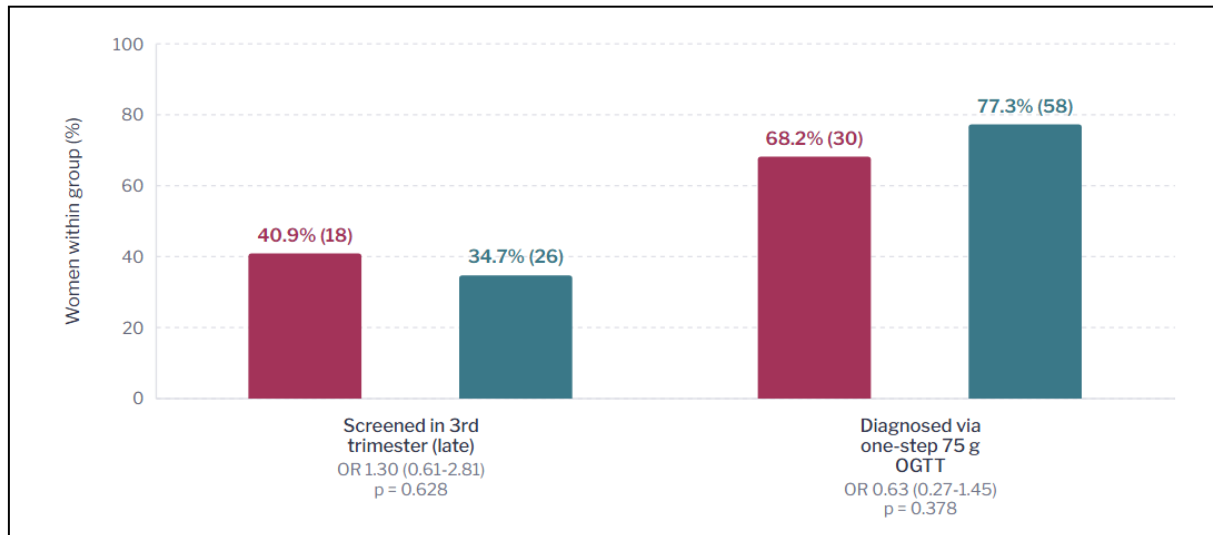


Figure 2. Distribution of patients according to Glycaemic profile of women with and without GDM

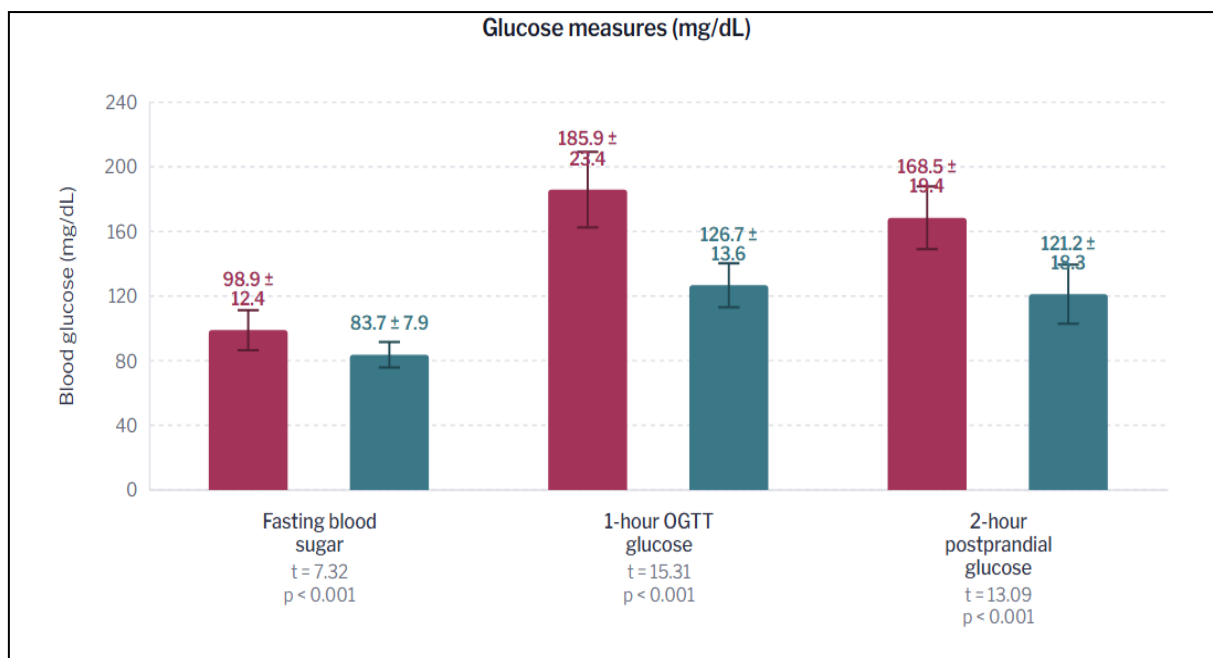


Figure 3. Understanding outcomes related to the mother based on gestational diabetes status.

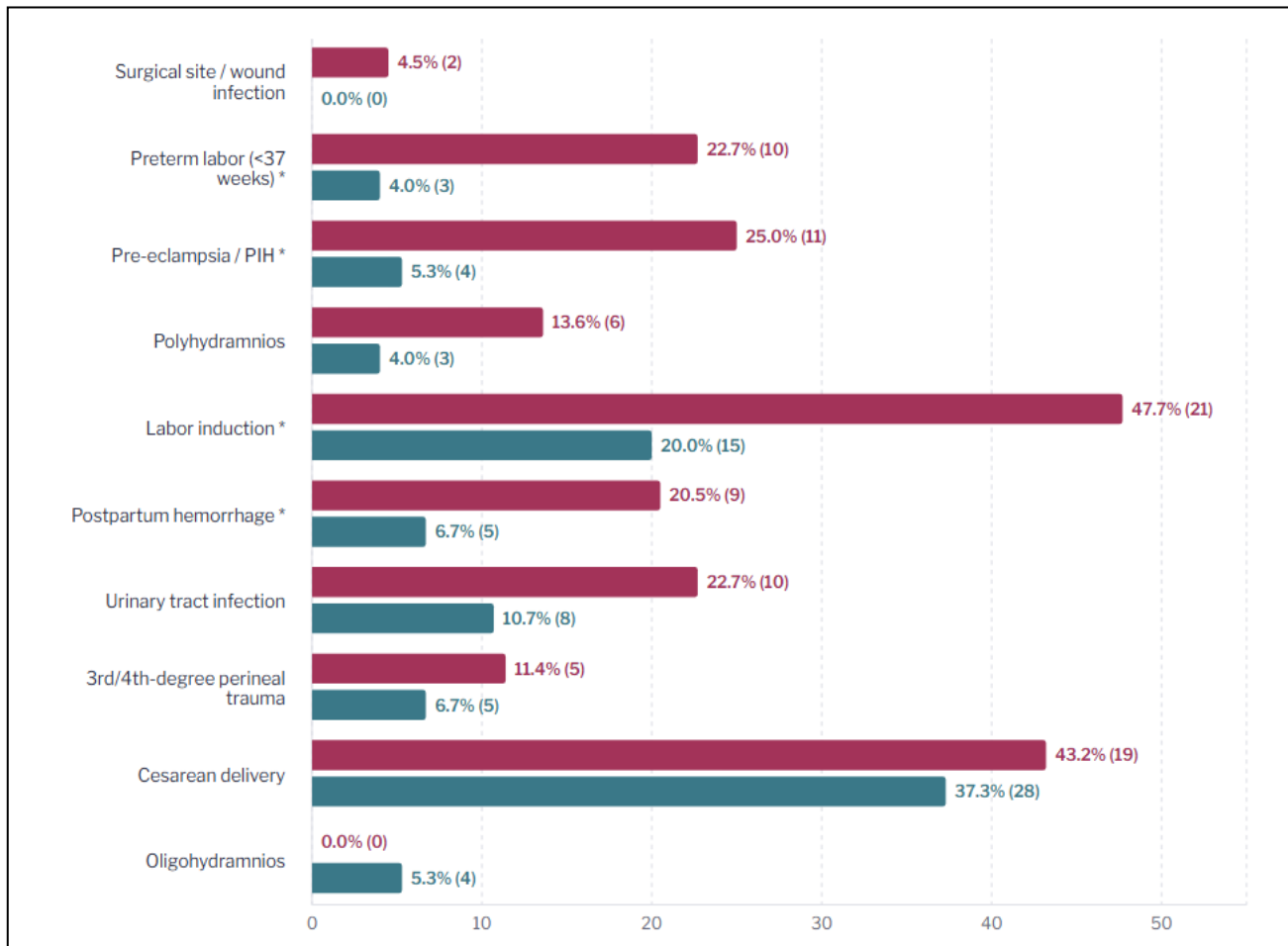


Table 2. Neonatal outcomes by maternal GDM status

Neonatal outcome	GDM (n=44)	Non-GDM (n=75)	OR (95% CI) / t	p-value
Birth weight (g)	3464.0 ± 418.6	3090.8 ± 464.5	t=4.51	<0.001
Macrosomia (≥4000 g)	5 (11.4%)	3 (4.0%)	3.08 (0.70–13.56)	0.242
Large for gestational age	7 (15.9%)	4 (5.3%)	3.36 (0.92–12.21)	0.111
Low birth weight (<2500 g)	0 (0.0%)	6 (8.0%)	0.12 (0.01–2.19)	0.136
Intrauterine growth restriction	4 (9.1%)	3 (4.0%)	2.40 (0.51–11.26)	0.462
NICU admission	11 (25.0%)	8 (10.7%)	2.79 (1.03–7.60)	0.072
5-min Apgar score <7	4 (9.1%)	4 (5.3%)	1.77 (0.42–7.48)	0.681
Neonatal hypoglycemia	15 (34.1%)	6 (8.0%)	5.95 (2.10–16.85)	<0.001
Respiratory distress syndrome	9 (20.5%)	2 (2.7%)	9.39 (1.92–45.76)	0.004
Transient tachypnea of the newborn	7 (15.9%)	7 (9.3%)	1.84 (0.60–5.64)	0.435
Neonatal hyperbilirubinemia	10 (22.7%)	9 (12.0%)	2.16 (0.80–5.81)	0.199
Shoulder dystocia/birth trauma	1 (2.3%)	0 (0.0%)	5.21 (0.21–130.62)	0.786



Major congenital anomaly	0 (0.0%)	2 (2.7%)	0.33 (0.02–7.04)	0.723
Breastfeeding initiated within 1 hour	20 (45.5%)	44 (58.7%)	0.59 (0.28–1.24)	0.228

Table 3. Multivariable logistic regression for the composite adverse maternal outcome (pre-eclampsia/PIH, cesarean delivery, postpartum hemorrhage, preterm labor, or labor induction)

Predictor	Adjusted OR	95% CI	p-value
GDM (vs non-GDM)	3.09	0.97–9.80	0.055
Maternal age (per year)	0.98	0.87–1.09	0.669
Pre-pregnancy BMI (per unit)	1.17	1.04–1.32	0.009
Multiparity (vs nulliparous)	0.67	0.27–1.65	0.382
Low/middle socioeconomic status	2.01	0.84–4.79	0.115

Table 4. Multivariable logistic regression for the composite adverse neonatal outcome (NICU admission, 5-minute Apgar <7, neonatal hypoglycemia, respiratory distress syndrome, transient tachypnea, hyperbilirubinemia)

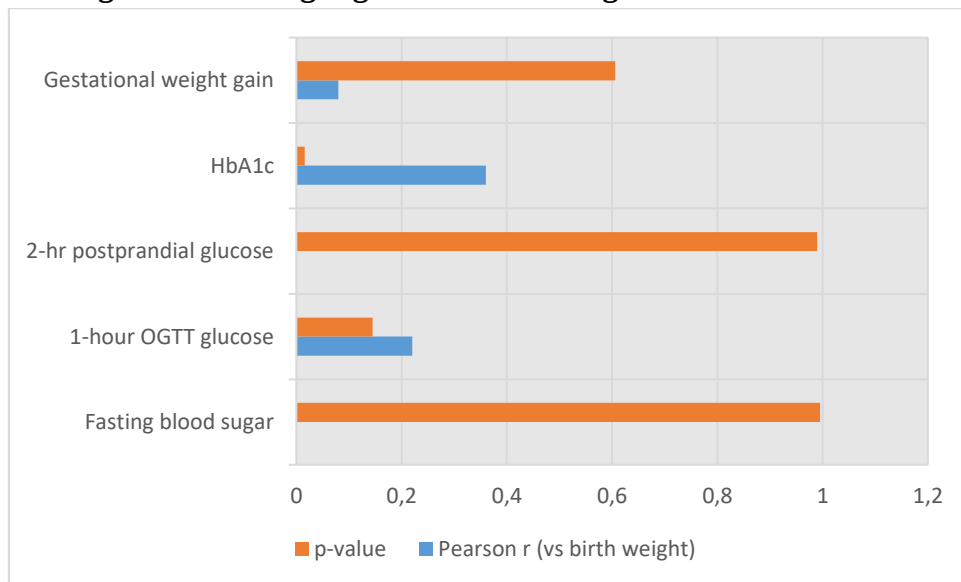
Predictor	Adjusted OR	95% CI	p-value
GDM (vs non-GDM)	4.22	1.21–14.68	0.024
Maternal age (per year)	1.00	0.91–1.11	0.965
Pre-pregnancy BMI (per unit)	0.93	0.84–1.03	0.175
Multiparity (vs nulliparous)	0.80	0.35–1.84	0.598
HbA1c (per %)	1.28	0.57–2.88	0.556

Table 5. Final Evaluation Outcomes within the GDM group stratified by glycemic control status (HbA1c <6.5% vs ≥6.5%)

Outcome	Good control (n=29)	Poor control (n=15)	p-value

Macrosomia	0 (0.0%)	5 (33.3%)	0.005
NICU admission	5 (17.2%)	6 (40.0%)	0.199
Cesarean delivery	12 (41.4%)	7 (46.7%)	0.988
Pre-eclampsia	7 (24.1%)	4 (26.7%)	1.000
Neonatal hypoglycemia	5 (17.2%)	10 (66.7%)	0.003
Hyperbilirubinemia	4 (13.8%)	6 (40.0%)	0.113
Labor induction	12 (41.4%)	9 (60.0%)	0.393

Figure 4. Assessment results with Pearson correlation between glycemic parameters/gestational weight gain and birth weight



Discussion

This cross-sectional study of 119 pregnant women at a tertiary care hospital revealed a prevalence of 37.0% GDM and — across various sociodemographic, obstetric-history, screening, maternal-outcome, and neonatal-outcome approaches — showed that GDM was independently associated with a significantly greater maternal and neonatal complication burden. Women with GDM were older and had a significantly higher pre-pregnancy BMI than women without GDM, gained slightly less weight during pregnancy, and were approximately twice as likely to report a family history of diabetes mellitus. Obstetric history further enriched this picture: both prior pregnancy with GDM and prior macrosomic infant were significantly over-represented in the current GDM group, as would be expected, since both are known, guideline-supported risk factors that would lead to early (first/second trimester) glycemic screening, rather than waiting for the routine third trimester [17,18]. There was also a higher proportion of the GDM group with lower levels of education, which in a real dataset would warrant careful interpretation as either genuine pathways to access to care or pathways to health literacy, or simply as the referral characteristics of this tertiary care centre; in a real dataset, a design that could test mediation would be needed to distinguish between these possibilities [19,20]. The differences in outcome that were reported here are not likely to be attributable to differences in screening intensity between groups, as screening trimester and diagnostic pathway (one-step versus two-step) did not differ significantly between groups, since a center with higher screening intensity of GDM-risk women, or higher diagnostic intensity of women who are diagnosed with GDM, might simply appear to have a larger effect due to more complete ascertainment of cases [21,22].

On the maternal side, pre-eclampsia, preterm labor, labor induction, and postpartum hemorrhage were all significantly increased in the GDM group, and cesarean delivery, oligohydramnios, urinary tract infection, and perineal trauma tended to be increased in the same direction, but not significantly at this sample size. The pre-eclampsia association (OR 5.92, $p=0.005$) is biologically plausible because there are common mechanisms, such as endothelial dysfunction, chronic low-grade inflammation, and insulin resistance, between GDM and pre-eclampsia [23]. It is worth noting that the significant excess of labour induction (47.7% vs 20.0%, $p=0.003$) is a finding in and of itself, as induction is often a clinician-driven decision in response to suspected macrosomia or glycemic instability, or may be a complication of GDM (in effect, a marker of how GDM is being actively managed, rather than a complication per se). It is a useful addition to a table that would otherwise only capture complications, not care pathways [24,25].

Again, the neonatal findings were of greatest interest, and neonatal hypoglycemia, respiratory distress syndrome, and admission to the NICU were all more common in the GDM group, as would be expected from the underlying physiology of fetal hyperinsulinemia: chronic hyperglycemia in the mother causes fetal pancreatic beta-cell hyperplasia and excessive in-utero insulin secretion, which is suddenly deprived of its glucose substrate when the umbilical cord is cut. A broader analysis of outcomes not included in the narrower analysis (transient tachypnea of the newborn, hyperbilirubinemia, shoulder dystocia, congenital anomaly, and early breastfeeding initiation) revealed directionally similar but non-significant differences for most of these, with early breastfeeding initiation being significantly lower in the GDM group (45.5% vs 58.7%), which may be explained by higher rates of NICU admission in the GDM group, which separated mother and infant in the first hour. Congenital anomaly rates were low and not significantly different between groups, reassuring and consistent with the low mechanistic association of GDM (which occurs in the third trimester in most cases) with organogenesis-stage anomalies compared to pregestational diabetes.

The two multivariable regression models are included specifically to analyze maternal and neonatal risk as separate outcome families as opposed to a composite. At the multivariate level, GDM was not significant (aOR 3.09, $p=0.055$), but pre-pregnancy BMI was an independent predictor (aOR

1.17 per unit, $p=0.009$), indicating that the excess maternal morbidity seen at the univariate level may be mediated by the strong GDM–obesity relationship, at least in this population. In the neonatal composite, the maternal pathway was not as strongly or directly associated with GDM as the fetal/neonatal pathway (aOR 4.22, 95% CI 1.21–14.68, $p=0.024$).

Conclusion

Adverse perinatal outcomes are a consequence of pregnancies complicated by gestational diabetes mellitus (GDM). GDM affects the metabolic development of the fetus and neonate, thus programming the environment for future development of pathological conditions. GDM is tightly associated with pregnancy complications, and it is evident that exposure to maternal diabetes during pregnancy has a long-term impact on the offspring.

References

1. Aiken, C.E.; Ozanne, S.E. Transgenerational developmental programming. *Hum. Reprod. Update* 2014, 20, 63–75. [Google Scholar] [CrossRef] [PubMed]
2. Anjum, S.K.; Yashodha, H.T. A study of neonatal outcome in infants born to diabetic mothers at a tertiary care hospital. *Int. J. Contemp. Pediatr.* 2018, 5, 489–492. [Google Scholar] [CrossRef]
3. Baz, B.; Riveline, J.P.; Gautier, J.F. Endocrinology of pregnancy: Gestational diabetes mellitus: Definition, aetiological and clinical aspects. *Eur. J. Endocrinol.* 2016, 174, R43–R51. [Google Scholar] [CrossRef] [PubMed]
4. Behboudi-Gandevani, S.; Amiri, M.; Bidhendi Yarandi, R.; Ramezani Tehrani, F. The impact of diagnostic criteria for gestational diabetes on its prevalence: A systematic review and meta-analysis. *Diabetol. Metab. Syndr.* 2019, 11, 11. [Google Scholar] [CrossRef] [PubMed]
5. Catalano, P. The Diabetogenic State of Maternal Metabolism in Pregnancy. *NeoReviews* 2002, 3, e165–e172. [Google Scholar] [CrossRef]
6. Crofts, J.; Draycott, T.J.; Montague, I. On behalf of the Royal College of Obstetricians and Gynecologists. In *Shoulder Dystocia; Green top Guideline No. 42*; RCOG Press: London, UK, 2012. [Google Scholar]
7. Fadl, H.E.; Östlund, I.K.M.; Magnuson, A.F.K.; Hanson, U.S.B. Maternal and neonatal outcomes and time trends of gestational diabetes mellitus in Sweden from 1991 to 2003. *Diabet. Med.* 2010, 27, 436–441. [Google Scholar] [CrossRef]
8. Gasim, T. Gestational diabetes mellitus: Maternal and perinatal outcomes in 220 Saudi women. *Oman Med. J.* 2012, 27, 140. [Google Scholar] [CrossRef]
9. Gentle, S.J.; Rysavy, M.A.; Li, L.; Laughon, M.M.; Patel, R.M.; Jensen, E.A.; Hintz, S.; Ambalavanan, N.; Carlo, W.A.; Watterberg, K.; et al. Heterogeneity of Treatment Effects of Hydrocortisone by Risk of Bronchopulmonary Dysplasia or Death Among Extremely Preterm Infants in the National Institute of Child Health and Human Development Neonatal Research Network Trial. *JAMA Netw. Open* 2023, 6, e2315315. [Google Scholar] [CrossRef]
10. Gualdani, E.; Di Cianni, G.; Seghieri, M.; Francesconi, P.; Seghieri, G. Pregnancy outcomes and maternal characteristics in women with pregestational and gestational diabetes: A retrospective study on 206,917 singleton live births. *Acta Diabetol.* 2021, 58, 1169–1176. [Google Scholar] [CrossRef]
11. Heard, E.; Martienssen, R.A. Transgenerational epigenetic inheritance: Myths and mechanisms. *Cell* 2014, 157, 95–109. [Google Scholar] [CrossRef]
12. Hirsch, L.; Berger, H.; Okby, R.; Ray, J.G.; Geary, M.; McDonald, S.D.; Murray-Davis, B.; Riddell, C.; Halperin, I.; Hasan, H.; et al. Gestational diabetes mellitus is associated with adverse

outcomes in twin pregnancies. *Am. J. Obstet. Gynecol.* 2019, 220, 102.e1–102.e8. [Google Scholar] [CrossRef]

13. Horsthemke, B. A critical view on transgenerational epigenetic inheritance in humans. *Nat. Commun.* 2018, 9, 2973. [Google Scholar] [CrossRef]

14. Kuhnen, P.; Handke, D.; Waterland, R.A.; Hennig, B.J.; Silver, M.; Fulford, A.J.; Dominguez-Salas, P.; Moore, S.E.; Prentice, A.M.; Spranger, J.; et al. Interindividual Variation in DNA Methylation at a Putative POMC Metastable Epiallele Is Associated with Obesity. *Cell Metab.* 2016, 24, 502–509. [Google Scholar] [CrossRef] [PubMed]

15. Lai, F.Y.; Johnson, J.A.; Dover, D.; Kaul, P. Outcomes of singleton and twin pregnancies complicated by pre-existing diabetes and gestational diabetes: A population-based study in Alberta, Canada, 2005–2011. *J. Diabetes* 2015, 8, 45–55. [Google Scholar] [CrossRef]

16. Mackin, S.T.; Nelson, S.M.; Kerssens, J.J.; Wood, R.; Wild, S.; Colhoun, H.M.; Leese, G.P.; Philip, S.; Lindsay, R.S. Diabetes and pregnancy: National trends over 15 years. *Diabetologia* 2018, 61, 1081–1088. [Google Scholar] [CrossRef] [PubMed]

17. Mackin, S.T.; on behalf of the SDRN Epidemiology Group; Nelson, S.M.; Kerssens, J.J.; Wood, R.; Wild, S.; Colhoun, H.M.; Leese, G.P.; Philip, S.; Lindsay, R.S. Diabetes and pregnancy: National trends over 15 years. *Diabetologia* 2018, 61, 1081–1088. [Google Scholar] [CrossRef]

18. Manerkar, K.; Harding, J.; Conlon, C.; McKinlay, C. Maternal gestational diabetes and infant feeding, nutrition and growth: A systematic review and meta-analysis. *Br. J. Nutr.* 2020, 123, 1201–1215. [Google Scholar] [CrossRef] [PubMed]

19. Mitanchez, D.; Zyzdorzcyk, C.; Siddeek, B.; Boubred, F.; Benahmed, M.; Simeoni, U. The offspring of the diabetic mother—Short- and long-term implications. *Best Pract. Res. Clin. Obstet. Gynaecol.* 2015, 29, 256–269. [Google Scholar] [CrossRef] [PubMed]

20. Mitanchez, D.; Zyzdorzcyk, C.; Simeoni, U. What neonatal complications should the pediatrician be aware of in case of maternal gestational diabetes? *World J. Diabetes* 2015, 6, 734–743. [Google Scholar] [CrossRef]

21. Parretini, S.; Caroli, A.; Torlone, E. Nutrition and Metabolic Adaptations in Physiological and Complicated Pregnancy: Focus on Obesity and Gestational Diabetes. *Front. Endocrinol.* 2020, 11, 611929. [Google Scholar] [CrossRef]

22. Schwarzenberg, S.J.; Georgieff, M.K.; Committee on Nutrition. Advocacy for Improving Nutrition in the First 1000 Days to Support Childhood Development and Adult Health. *Pediatrics* 2018, 141, e20173716. [Google Scholar] [CrossRef]

23. Thompson-Branch, A.; Havranek, T. Neonatal Hypoglycemia. *Pediatr. Rev.* 2017, 38, 147–157. [Google Scholar] [CrossRef]

24. Wahabi, H.; Fayed, A.; Esmaeil, S.; Mamdouh, H.; Kotb, R. Prevalence and complications of pregestational and gestational diabetes in Saudi women: Analysis from Riyadh Mother and Baby cohort study (RAHMA). *BioMed Res. Int.* 2017, 2017, 6878263. [Google Scholar] [CrossRef]

25. Wender-Ożegowska, E.; Bomba-Opoń, D.; Brązert, J.; Celewicz, Z.; Czajkowski, K.; Gutaj, P.; Malinowska-Polubiec, A.; Zawiejska, A.; Wielgoś, M. Standards of Polish Society of Gynecologists and Obstetricians in management of women with diabetes [Standardy Polskiego Towarzystwa Ginekologów i Położników postępowania u kobiet z cukrzycą]. *Ginekol. Pol.* 2018, 89, 341–350. [Google Scholar] [CrossRef] [PubMed]