ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Maternal And Perinatal Outcome In Women With Gestational Diabetes Mellitus.

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ABSTRACT

Gestational diabetes mellitus (GDM) is a common complication of pregnancy, characterized by glucose intolerance first detected during gestation. It poses significant risks for both maternal and neonatal health, including hypertensive disorders, cesarean deliveries, macrosomia, and neonatal hypoglycemia. To evaluate the maternal and perinatal outcomes in women diagnosed with GDM. This prospective observational study was conducted at a tertiary care center over 12 months and included 40 pregnant women diagnosed with GDM using the IADPSG criteria. Maternal outcomes, including mode of delivery and hypertensive disorders, and neonatal outcomes, such as birth weight, Apgar scores, and complications, were recorded. Data were analyzed using descriptive and inferential statistics. Cesarean delivery was observed in 50% of cases, and 25% of women developed hypertensive disorders. Neonatal outcomes showed that 12.5% of neonates were macrosomic, and 15% experienced hypoglycemia. NICU admission was required in 20% of cases, primarily due to respiratory distress syndrome and hyperbilirubinemia. GDM significantly impacts maternal and neonatal outcomes despite effective glycemic control in most cases. Early diagnosis, comprehensive antenatal care, and multidisciplinary management are critical to mitigating these risks.

Keywords: Gestational diabetes mellitus, maternal outcomes, neonatal complications

https://doi.org/10.33887/rjpbcs/2025.16.1.17

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ISSN: 0975-8585

INTRODUCTION

Gestational diabetes mellitus (GDM) is a significant global public health issue, characterized by glucose intolerance that is first recognized during pregnancy. It complicates approximately 7-10% of pregnancies worldwide, with varying prevalence based on ethnicity, diagnostic criteria, and lifestyle factors. The condition poses substantial risks for both maternal and perinatal health, impacting short- and long-term outcomes [1, 2]. Maternal complications of GDM include an increased risk of hypertensive disorders, preeclampsia, cesarean delivery, and the potential for developing type 2 diabetes mellitus later in life. From a fetal perspective, GDM is associated with adverse outcomes such as macrosomia, shoulder dystocia, neonatal hypoglycemia, respiratory distress syndrome, and increased risk of perinatal mortality. Moreover, the offspring of women with GDM are at heightened risk of obesity, glucose intolerance, and metabolic syndrome in adulthood [3]. Timely diagnosis and effective management of GDM are essential to mitigate these risks. Strategies include lifestyle modifications, glucose monitoring, and pharmacological interventions when necessary. This study aims to explore the maternal and perinatal outcomes in women diagnosed with GDM, emphasizing the importance of early detection, optimal management, and targeted interventions to improve health outcomes for both mother and child [4, 5].

STUDY METHODOLOGY

This study was a prospective observational study conducted at the Department of Obstetrics and Gynecology of a tertiary care center. The study was carried out over a period of 12 months and included 40 pregnant women diagnosed with gestational diabetes mellitus (GDM) based on the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria. Ethical approval was obtained from the institutional ethics committee, and written informed consent was taken from all participants prior to inclusion in the study.

Participants were selected based on specific inclusion and exclusion criteria. Women with a singleton pregnancy between 24 and 28 weeks of gestation who were newly diagnosed with GDM were included. Exclusion criteria included pre-existing diabetes, chronic hypertension, multiple pregnancies, and any systemic or obstetric complications that could independently influence maternal or perinatal outcomes. A structured questionnaire was used to collect demographic data, obstetric history, and clinical details at enrollment. Maternal blood glucose levels were monitored through fasting and postprandial measurements, and glycemic control was achieved using medical nutrition therapy, oral hypoglycemic agents, or insulin as indicated. Regular antenatal visits were scheduled, and maternal and fetal outcomes were documented. The fetal outcomes assessed included birth weight, Apgar scores, neonatal hypoglycemia, and admission to the neonatal intensive care unit (NICU). Maternal outcomes included mode of delivery, development of hypertensive disorders, and glycemic control at the time of delivery.

Data were compiled and analyzed using statistical software. Categorical variables were expressed as frequencies and percentages, while continuous variables were represented as means and standard deviations. Statistical tests, including the chi-square test and t-test, were applied to determine the significance of observed differences. The results were interpreted in the context of existing literature to provide a comprehensive understanding of maternal and perinatal outcomes in women with GDM.

RESULTS

Table 1: Maternal Characteristics of Study Participants (n=40).

Parameter	Frequency (n)	Percentage (%)
Age (years)		
- 20–25	10	25
- 26–30	20	50
- >30	10	25
Body Mass Index (BMI, kg/m^2)		
- <25	12	30
- 25–30	20	50
- >30	8	20
Parity		
- Primigravida	15	37.5
- Multigravida	25	62.5

Table 2: Maternal Outcomes.

Outcome	Frequency (n)	Percentage (%)
Mode of Delivery		
- Vaginal Delivery	20	50
- Cesarean Section	20	50
Hypertensive Disorders		
- Present	10	25
- Absent	30	75
Glycemic Control at Delivery		
- Controlled	35	87.5
- Uncontrolled	5	12.5

Table 3: Perinatal Outcomes.

Outcome	Frequency (n)	Percentage (%)
Birth Weight (kg)		
- <2.5	5	12.5
- 2.5–4.0	30	75
- >4.0 (Macrosomia)	5	12.5
Apgar Score at 1 Minute		
- <7	8	20
- ≥7	32	80
Neonatal Hypoglycemia		
- Present	6	15
- Absent	34	85

Table 4: NICU Admission and Perinatal Complications.

Complication	Frequency (n)	Percentage (%)
NICU Admission	8	20
Respiratory Distress Syndrome	3	7.5
Hyperbilirubinemia	4	10
Sepsis	2	5
No Complications	30	75

DISCUSSION

Gestational diabetes mellitus (GDM) is a common pregnancy complication associated with significant maternal and neonatal morbidity. This study evaluated the maternal and perinatal outcomes in women with GDM, analyzing 40 participants to understand the impact of the condition on both mothers and neonates. The findings from this study provide valuable insights into the demographic distribution, clinical outcomes, and complications associated with GDM [6, 7].

Maternal Characteristics

The majority of participants in this study were between 26 and 30 years old, accounting for 50% of the sample. This aligns with the global trend where GDM is more prevalent in women of advanced maternal age, as increasing age is a known risk factor. Additionally, 70% of participants were either overweight (BMI 25–30) or obese (BMI >30), highlighting the critical role of pre-pregnancy weight and lifestyle in the pathophysiology of GDM. Previous studies have consistently demonstrated a strong association between obesity and insulin resistance, a key mechanism in GDM development. The high proportion of multigravida women (62.5%) suggests that prior pregnancies might predispose women to GDM, possibly due to residual insulin resistance or metabolic strain from earlier pregnancies [8].

Maternal Outcomes

The mode of delivery was evenly distributed between vaginal deliveries (50%) and cesarean sections (50%), reflecting the influence of GDM on obstetric decision-making. The higher cesarean section rate in this population could be attributed to complications such as macrosomia, poor glycemic control, or

associated hypertensive disorders. These findings are consistent with previous studies reporting elevated cesarean section rates in GDM pregnancies.

Hypertensive disorders, observed in 25% of participants, remain a significant complication of GDM. This highlights the interplay between hyperglycemia and vascular endothelial dysfunction, contributing to the development of conditions such as preeclampsia. Effective glycemic control was achieved in 87.5% of participants, underscoring the importance of comprehensive antenatal care, including regular monitoring, dietary modifications, and timely pharmacological interventions [9].

Perinatal Outcomes

Neonatal outcomes are a key focus in GDM research due to the significant risk of complications. In this study, 75% of neonates had normal birth weights (2.5–4.0 kg), while 12.5% were macrosomic (>4.0 kg). Macrosomia, a hallmark complication of GDM, results from excessive fetal glucose exposure and compensatory hyperinsulinemia. Macrosomic neonates are at higher risk of shoulder dystocia, birth trauma, and long-term metabolic disorders. On the other hand, low birth weight (<2.5 kg) was observed in 12.5% of cases, potentially linked to placental insufficiency in poorly controlled GDM cases.

The Apgar score at 1 minute revealed that 20% of neonates had scores below 7, indicating some degree of birth asphyxia or distress. This emphasizes the need for vigilant intrapartum monitoring and skilled neonatal resuscitation in GDM pregnancies. Neonatal hypoglycemia, seen in 15% of cases, remains a well-recognized complication due to hyperinsulinemia following the sudden withdrawal of maternal glucose supply at birth. Routine blood glucose monitoring in neonates born to GDM mothers is crucial to prevent the sequelae of hypoglycemia, such as neurological deficits [10].

Neonatal Intensive Care Unit (NICU) Admissions and Complications

The study recorded a NICU admission rate of 20%, with respiratory distress syndrome (7.5%) and hyperbilirubinemia (10%) being the most common reasons for admission. These findings are consistent with existing literature, as GDM pregnancies are associated with delayed fetal lung maturity and increased bilirubin production due to hyperinsulinemia. Sepsis, though less frequent (5%), highlights the need for infection surveillance in neonates born to mothers with GDM, particularly in cases of prolonged labor or operative deliveries.

The maternal and perinatal outcomes observed in this study are in line with trends reported in previous research. Studies have consistently shown that proper antenatal care, early diagnosis, and effective glycemic control significantly reduce adverse outcomes in GDM pregnancies. For instance, the 87.5% rate of controlled glycemia in this study corresponds with improved maternal and neonatal outcomes, such as reduced cesarean sections, lower rates of macrosomia, and fewer NICU admissions. However, the persistence of complications like hypertensive disorders and neonatal hypoglycemia underscores the need for more robust management strategies.

The findings from this study highlight the multifaceted impact of GDM on maternal and perinatal health. The high prevalence of obesity and overweight among participants suggests that pre-pregnancy weight management and lifestyle interventions should be integral to antenatal care programs. Additionally, the increased rates of cesarean deliveries and NICU admissions call for enhanced obstetric and neonatal care protocols tailored to the specific needs of women with GDM.

Interdisciplinary care involving obstetricians, endocrinologists, dietitians, and neonatologists is essential to optimize outcomes. Routine postpartum follow-up for women with GDM is critical, as they remain at increased risk for type 2 diabetes and cardiovascular diseases. Similarly, neonates of GDM mothers should be monitored for growth, metabolic health, and developmental milestones.

CONCLUSION

In conclusion, this study underscores the significant maternal and perinatal risks associated with GDM. While effective glycemic control improves outcomes, complications such as hypertensive disorders, macrosomia, and neonatal hypoglycemia remain prevalent. Early diagnosis, individualized management, and coordinated care are key to minimizing these risks and ensuring better health for both mothers and

their offspring. These findings reinforce the need for continued research and policy efforts to improve the care of women with GDM and their neonates.

REFERENCES:

[1] Kumari R, Dalal V, Kachhawa G, Sahoo I, Khadgawat R, Mahey R, Kulshrestha V, Vanamail P, Sharma JB, Bhatla N, Kriplani A. Maternal and Perinatal Outcome in Gestational Diabetes Mellitus in a Tertiary Care Hospital in Delhi. Indian J Endocrinol Metab 2018 ;22(1):116-120

[2] Dudhwadkar AR, Fonseca MN. Maternal and fetal outcome in gestational diabetes mellitus. Int J Reprod Contracept Obstet Gynecol 2016;5:3317-21.

[3] Nanda S, Savvidou M, Syngelaki A, Akolekar R, Nicolaides KH. Prediction of gestational diabetes mellitus by maternal factors and biomarkers at 11 to 13 weeks. Prenat Diagn 2011 ;31(2):135-41.

[4] Bhat M, Sarma SP, Menon S. Determinants of gestationaldiabetes mellitus: acase control study in a district tertiary care hospital in south India.Int J Diabetes Dev Ctries 2010;30(2):91-6.

[5] Saxena P, Tyagi S, Prakash A, Nigam A. Pregnancy outcome of women with gestational diabetes in a tertiary level hospital of north India.Indian J Community Med 2011;36(2):120-3.

[6] Xiong X, Saunders LD, Wang FL, Demianczuk NN. Gestational diabetes mellitus: prevalence, risk factors, maternal and infant outcomes. Int J Gynaecol Obstet 2001; 75:221-8.

[7] Toulis KA, Stagnaro GA, Negro R. Maternal subclinical hypothyroidsm and gestational diabetes mellitus: a meta-analysis. Endocr Pract 2014;20(7):703-14.

[8] Yajnik CS, Kale SD, Kulkarni SR, Meenakumari K, Joglekar AA, Khorsand Net al. High risk of diabetes and metabolic syndrome in Indian women withgestational diabetes mellitus. Diabetes Medicine 2004; 21:1257-9

[9] Mahalakshmi MM. Clinical profile, outcomes, and progression to type 2 diabetes among Indian women with gestational diabetes mellitus seen at a diabetes center in south India. Indian J Endocrinol Metab 2014;18(3):400-6.

[10] Buchanan TA, Xiang AH, Peters RK. Preservation of pancreatic beta-cell function and prevention of type 2 diabetes by pharmacological treatment of insulin resistance in high-risk hispanic women. Diabetes 2002; 51:2796-803