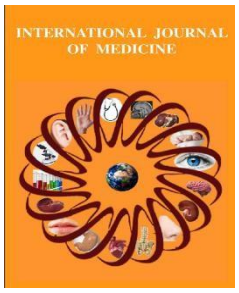
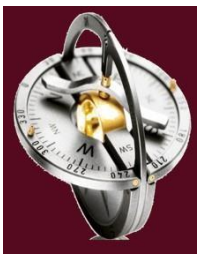


International Journal of Medicine
ISSN (P): 1468-3814; ISSN (e): 2667-7008
https://www.theinternationalmedicine.com



Volume: 6(1) 2024

Research Article

Maternal And Perinatal Outcomes In Gestational Diabetes Mellitus

[1]Dr Renu Mishra, [2]Dr. Rajesh Kumar, [3]Dr. Pramod Kumar
[1]Assistant Professor ,Department of Obs and gynae,Career Institute of Medical Sciences and Hospital
[2]MBBS , Junior Resident , Department of CTVS , VMMC & Safdarjung Hospital , New Delhi
[3]MBBS, Resident , Dept. Of Cardiology , Fortis Escort Heart Institute, New Delhi.

Abstract

Introduction: Gestational diabetes mellitus (GDM) is defined as a carbohydrate intolerance first diagnosed in pregnancy and may be associated with adverse maternal and perinatal outcome. Aim: The aim of the study was to determine the maternal and perinatal outcome in GDM during pregnancy. Materials and Methods: It is a retrospective analysis of women diagnosed with GDM who got antenatal care and delivered in our hospital in previous 5 years. Another 191 women with normal pregnancy without GDM and other medical conditions were taken as control. The baseline characteristics (age, body mass index, religion, and socioeconomic status) were noted in all cases. Diagnosis of GDM was made using oral glucose tolerance test with 75 g glucose. GDM patients were started on diet following which insulin or oral hypoglycemic agents were given if required. Maternal and perinatal outcome was noted in all women. ***Aims:*** To evaluate and compare the maternal and perinatal outcomes in pregnancies complicated by gestational diabetes mellitus with those of non-GDM pregnancies, and to assess the impact of treatment modalities on pregnancy outcomes. ***Results:*** The prevalence of gestational diabetes mellitus (GDM) in the present study was 5.72%, with fasting blood sugar as the most common diagnostic method (77.1%); management primarily involved dietary modification alone (75.0%), followed by insulin therapy (16.7%) and oral hypoglycemic agents (8.3%). Baseline characteristics such as age and body mass index were comparable between GDM and non-GDM groups, though a significantly higher proportion of GDM patients belonged to the middle socioeconomic class and had a positive family history of diabetes mellitus. Antenatal complications, particularly gestational hypertension and preeclampsia, along with preterm delivery, were significantly more frequent in the GDM group, while neonates born to GDM mothers showed higher mean birth weight, increased incidence of large-for-date babies, and neonatal hypoglycemia, with comparable Apgar scores and other complications. ***Conclusion***: The prevalence of GDM was 5.72% in this study. Adequate treatment of GDM on diet, oral hypoglycemic agents, or insulin to achieve euglycemia can achieve near-normal maternal and neonatal outcome.

Keywords: Gestational diabetes mellitus, oral glucose tolerance test, perinatal complication, prevalence.

Introduction:

The World Health Organization defines gestational diabetes mellitus (GDM) as any level of glucose intolerance that develops or is initially identified during pregnancy.[1Due to the use of various diagnostic criteria, the prevalence of this frequent issue ranges from 2% to 22% of all pregnancies.[2] Ninety to ninety-five percent of pregnant women with diabetes have GDM.[3] Because different organizations employ different criteria, there are disputes over screening, diagnostic instruments, and the usage of glucose level thresholds.[2]Due to a variety of confounding factors, including obesity, advanced maternal age, and other comorbidities, many studies that report maternal and fetal complications with GDM were flawed.[4] Hyperglycemia and bad pregnancy outcome (HAPO) presented the strongest evidence of a poor pregnancy outcome in gestational diabetes.[5] Following this study, fasting ≥92 mg, 1 h ≥180 mg/dl, and 2 h ≥153 mg/dl plasma glucose readings (any single value exceeding the specified limit) are considered GDM in the 75 g oral glucose tolerance test (GTT).[6] Seshiah et al. conducted a community-based study on the prevalence of GDM in South India and developed Indian guidelines treating the condition that are frequently applied in India.[7].

Address for Correspondence: Dr Renu Mishra, Assistant Professor ,Department of Obs and gynae,Career Institute of Medical Sciences and Hospital.

DOI: 10.61336/im/26-1-11

METHODOLOGY

Study Design: This was a hospital-based observational comparative study conducted to evaluate maternal and perinatal outcomes in pregnancies complicated by gestational diabetes mellitus (GDM) and compare them with non-GDM pregnancies.
Place of Study:The study was conducted in the Department of Obstetrics and Gynaecology at a tertiary care teaching hospital.
Period of Study:The study was carried out over a period of 18 month

Study Variables:
Exposure variable:
Gestational diabetes mellitus (GDM status)
Diagnostic variables (GDM):
Fasting blood sugar, 1-hour glucose value, 2-hour glucose value
Treatment variables (GDM):
Diet therapy, insulin, oral hypoglycaemic agents
Baseline variables:
Maternal age, body mass index, religion, socioeconomic status, family history of diabetes
Antenatal complications:

Urinary tract infection, gestational hypertension/preeclampsia, polyhydramnios, vaginal candidiasis
Obstetric outcomes:
Preterm delivery, mode of delivery, postpartum haemorrhage, postpartum sepsis
Perinatal outcomes:
Birth weight, APGAR score (1 and 5 min), birth weight category (AFD/LFD/SFD), neonatal complications (hypoglycaemia, hyperbilirubinemia, respiratory distress syndrome, congenital anomalies)

Sample Size
A total of 96 pregnant women were included in the study.
- GDM group: 48 patients
- Non-GDM group: 48 patients

Inclusion Criteria
- Pregnant women diagnosed with gestational diabetes mellitus according to standard diagnostic criteria (for GDM group)
- Pregnant women with normal glucose tolerance (for non-

GDM group)

- Singleton pregnancy
- Gestational age ≥ 24 weeks
- Willingness to participate and provide informed consent

Exclusion Criteria

- Pregnant women with pre-existing diabetes mellitus (Type 1 or Type 2)
- Multiple pregnancies
- Pregnancies complicated by chronic medical disorders such as:
  - Chronic hypertension
  - Renal disease
  - Thyroid disorders
- Known fetal congenital anomalies
- Incomplete medical records

STATISTICAL ANALYSIS

IBM SPSS version 20.0, a statistical product services solution from IBM Corp. in Armonk, New York, was used for all data analysis. The proper statistical test was used to assess the continuous data's normality assumption. Descriptive statistics including mean, standard deviation, and range values were computed for continuous variables that were normally distributed. Student's t-independent test was used to compare the means of two groups. The interquartile range and median values were calculated for nonnormal data. The nonparametric Mann-Whitney U-test was used to compare median values. Data were displayed as frequency and percent values for categorical variables. Chi-square and Fisher's exact tests were used as necessary to compare frequency data across categories. For every statistical test, a two-sided probability of $P < 0.05$ was deemed statistically significant.

RESULT

Table 1: Method of Diagnosis and Modes of Treatment for Gestational Diabetes Mellitus (n = 48)

(a) Method of Diagnosis

Method of diagnosis	GDM (n = 48)	Percentage (%)
Fasting blood sugar	37	77.1
1-hour value	18	37.5
2-hour value	16	33.3

(b) Modes of Treatment for Gestational Diabetes Mellitus

Mode of treatment	Number of patients	Percentage (%)
Diet only	36	75
Insulin	8	16.7
OHA	4	8.3

GDM: Gestational diabetes mellitus; OHA: Oral hypoglycaemic agents

Table 2: Baseline Characteristics of GDM and Non-GDM Patients

	Variables	GDM (n = 48)	Non-GDM (n = 48)	P value
Age	Age (years ± SD)	28.6 ± 4.2	28.4 ± 4.5	0.94
BMI	BMI (kg/m² ± SD)	25.8 ± 4.9	25.3 ± 5.1	0.71
Religion (%)	Hindu	30 (62.5)	28 (58.3)	0.82
	Muslim	14 (29.2)	16 (33.3)	
	Christian	4 (8.3)	4 (8.3)	
Socioeconomic status (%)	Lower	10 (20.8)	18 (37.5)	0.02
	Middle	30 (62.5)	22 (45.8)	
	Upper	8 (16.7)	8 (16.7)	
History of diabetes in family (%)	History of diabetes in family (%)	12 (25.0)	5 (10.4)	0.04

Table 3: Antenatal Complications in GDM and Non-GDM Patients

Complications	GDM (n = 48)	Non-GDM (n = 48)	P value
UTI	8 (16.7)	4 (8.3)	0.23
Gestational hypertension / Preeclampsia	10 (20.8)	4 (8.3)	0.04
Polyhydramnios	3 (6.3)	0 (0)	0.08
Vaginal candidiasis	4 (8.3)	2 (4.2)	0.40

Table 4: Obstetric Outcomes in GDM and Non-GDM Groups

Outcome	GDM (n = 48)	Non-GDM (n = 48)	P value
Preterm delivery	7 (14.6)	3 (6.3)	0.04
Mode of delivery			
Vaginal	22 (45.8)	26 (54.2)	0.29
Caesarean section	24 (50.0)	20 (41.7)	
Instrumental delivery	2 (4.2)	2 (4.2)	
Postpartum haemorrhage	2 (4.2)	1 (2.1)	0.55
Postpartum sepsis	1 (2.1)	1 (2.1)	1.00

Table 5: Perinatal Outcome and Neonatal Complications in Two Groups

Variables	GDM (n = 48)	Non-GDM (n = 48)	P value
Birth weight (g ± SD)	2860.4 ± 360.2	2705.6 ± 340.8	0.04
Apgar score at 1 min (mean ± SD)	8.1 ± 1.3	8.0 ± 0.9	0.95
Apgar score at 5 min (mean ± SD)	8.6 ± 1.4	8.7 ± 0.8	0.36
Distribution of birth weight (%)			
AFD	32 (66.7)	30 (62.5)	
LFD	14 (29.2)	9 (18.8)	0.03
SFD	2 (4.2)	9 (18.8)	
Neonatal complications (%)			
Hypoglycaemia	10 (20.8)	5 (10.4)	0.04
Hyperbilirubinemia	3 (6.3)	2 (4.2)	0.64
Respiratory distress syndrome	4 (8.3)	2 (4.2)	0.4
Congenital anomalies	4 (8.3)	2 (4.2)	0.4

Figure1: Distribution of Study Population

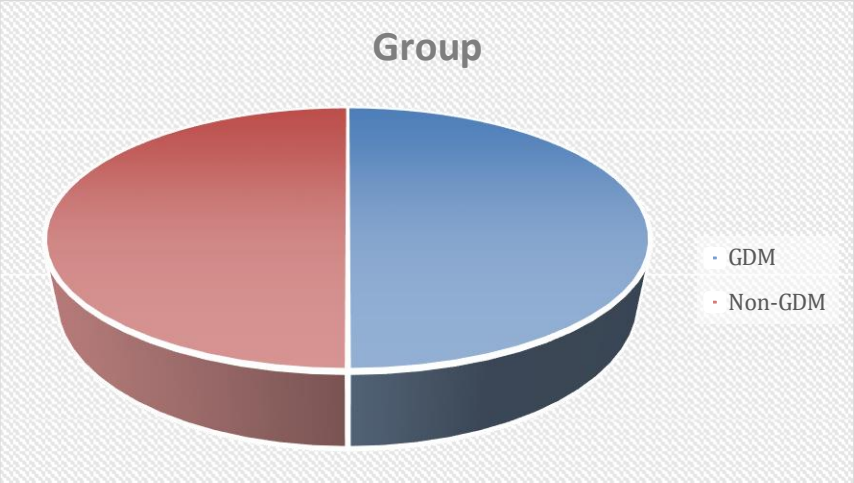
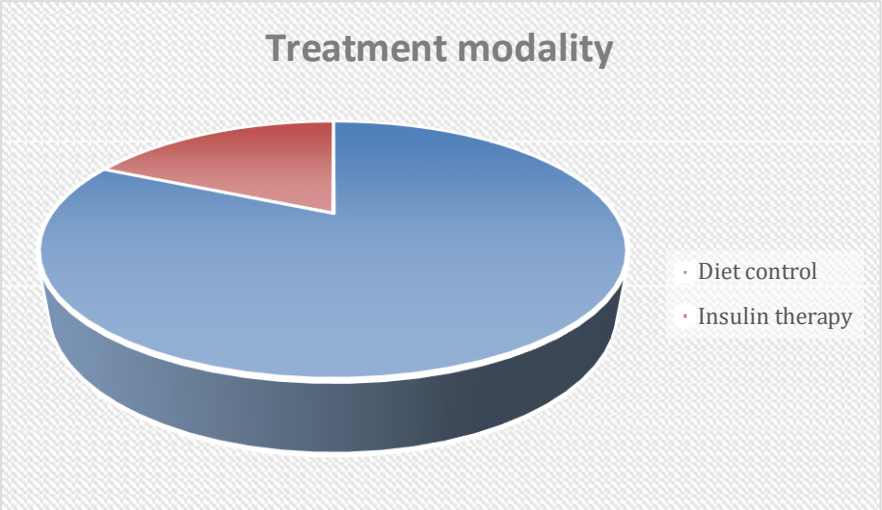


Figure2: Mode of Treatment Among GDM Patients



Among the 48 patients diagnosed with gestational diabetes mellitus, fasting blood sugar was the most commonly used method of diagnosis, identifying 37 patients (77.1%). The 1-hour post-glucose value contributed to the diagnosis in 18 patients (37.5%), while the 2 -hour value was positive in 16 patients (33.3%).

With respect to treatment modalities, the majority of patients were successfully managed with dietary modification alone, accounting for 36 cases (75.0%). Insulin therapy was required in 8 patients (16.7%), whereas oral hypoglycaemic agents were used in 4 patients (8.3%). These findings indicate that most women with gestational diabetes mellitus could be adequately controlled with non-pharmacological measures, with only a minority requiring pharmacological intervention.

The baseline characteristics of patients with gestational diabetes mellitus (GDM) and non-GDM were comparable with respect to age and body mass index. The mean age of patients in the GDM group was 28.6 ± 4.2 years, while that of the non-GDM group was 28.4 ± 4.5 years, with no statistically significant difference ($p = 0.94$). Similarly, the mean BMI was 25.8 ± 4.9 kg/m² in the GDM group and 25.3 ± 5.1 kg/m² in the non-GDM group, which was not statistically significant ($p = 0.71$).

In terms of religious distribution, Hindus constituted the majority in both groups, accounting for 62.5% in the GDM group and 58.3% in the non-GDM group, followed by Muslims and Christians. There was no significant association between religion and the occurrence of GDM ($p = 0.82$).

A statistically significant difference was observed in socioeconomic status between the two groups ($p = 0.02$). Patients belonging to the middle socioeconomic class were more common in the GDM group (62.5%) compared to the non-GDM group (45.8%), whereas a higher proportion of patients from the lower socioeconomic class was seen in the non-GDM group (37.5% vs. 20.8%).

A positive family history of diabetes mellitus was significantly more frequent among GDM patients, observed in 12 cases (25.0%), compared to 5 cases (10.4%) in the non-GDM group, and this association was statistically significant ($p = 0.04$).

Antenatal complications were more frequently observed among patients with gestational diabetes mellitus compared to the non-GDM group. Urinary tract infection was reported in 8 patients (16.7%) in the GDM group and in 4 patients (8.3%) in the non-GDM group; however, this difference was not statistically significant ($p = 0.23$).

Gestational hypertension and preeclampsia were significantly more common in the GDM group, occurring in 10 patients (20.8%) compared to 4 patients (8.3%) in the non-GDM group, and this association was statistically significant ($p = 0.04$). Polyhydramnios was observed only among GDM patients in 3 cases (6.3%) and was absent in the non-GDM group, though the difference did not reach statistical significance ($p = 0.08$). Vaginal candidiasis was noted in 4 patients (8.3%) in the GDM group and 2 patients (4.2%) in the non-GDM group, with no statistically significant difference between the groups ($p = 0.40$).

Preterm delivery was more frequent among patients with gestational diabetes mellitus, occurring in 7 cases (14.6%) compared to 3 cases (6.3%) in the non-GDM group, and this difference was statistically significant ($p = 0.04$).

Regarding the mode of delivery, vaginal delivery was observed in 22 patients (45.8%) in the GDM group and 26 patients (54.2%) in the non-GDM group. Caesarean section was performed in 24 patients (50.0%) with GDM and in 20 patients (41.7%) without GDM, while instrumental delivery was required in 2 patients (4.2%) in both groups. The difference in the mode of delivery between the two groups was not statistically significant ($p = 0.29$).

Postpartum complications were comparable between the groups. Postpartum haemorrhage occurred in 2 patients (4.2%) in the GDM group and in 1 patient (2.1%) in the non-GDM group, with no statistically significant difference ($p = 0.55$). Postpartum sepsis was noted in one patient in each group (2.1%), showing no significant association with gestational diabetes mellitus ($p = 1.00$).

Neonatal outcomes differed between the two groups. The mean birth weight was significantly higher in neonates born to mothers with gestational diabetes mellitus (2860.4 ± 360.2 g) compared to those born to non-GDM mothers (2705.6 ± 340.8 g), and this difference was statistically significant ($p = 0.04$). The Apgar scores at 1 minute and 5 minutes were comparable between the two groups, with no statistically significant differences observed ($p = 0.95$ and $p = 0.36$, respectively).

With respect to the distribution of birth weight, the majority of neonates in both groups were appropriate for dates (AFD), accounting for 66.7% in the GDM group and 62.5% in the non-GDM group. Large-for-dates (LFD) neonates were significantly more common in the GDM group

(29.2%) compared to the non-GDM group (18.8%), while small-for-dates (SFD) neonates were more frequently observed in the non-GDM group (18.8% vs. 4.2%). This difference in birth weight distribution was statistically significant (p = 0.03).

Neonatal complications were more prevalent in the GDM group. Hypoglycaemia was significantly higher among neonates of GDM mothers, occurring in 10 cases (20.8%) compared to 5 cases (10.4%) in the non-GDM group (p = 0.04). Other complications, including hyperbilirubinemia, respiratory distress syndrome, and congenital anomalies, were observed more frequently in the GDM group; however, these differences were not statistically significant (p = 0.64, p = 0.40, and p = 0.40, respectively).

Out of the total study population of 96 patients, an equal number were allocated to the two groups. The gestational diabetes mellitus (GDM) group comprised 48 patients (50.0%), while the non-GDM group also included 48 patients (50.0%), indicating an equal distribution of cases and controls.

Among the 48 patients diagnosed with gestational diabetes mellitus, the majority were managed with dietary modification alone, accounting for 36 patients (75.0%). Insulin therapy was required in 8 patients (16.7%), while oral hypoglycaemic agents were used in 4 patients (8.3%). These findings suggest that most cases of gestational diabetes mellitus could be effectively controlled with non-pharmacological measures, with only a smaller proportion requiring pharmacological treatment.

DISCUSSION

In the present study, fasting blood sugar was the most commonly positive diagnostic parameter for gestational diabetes mellitus, identifying 37 out of 48 patients (77.1%). The 1-hour and 2-hour post-glucose values contributed to diagnosis in 18 (37.5%) and 16 patients (33.3%), respectively, indicating that fasting glucose remains a reliable screening tool in routine antenatal practice. With regard to management, the majority of women with GDM were successfully treated with dietary modification alone (75.0%), while insulin therapy was required in 16.7% and oral hypoglycaemic agents in 8.3% of cases. These results imply that most patients can achieve adequate glycemic control with non-pharmacological means when diagnosed early, with only a small percentage needing pharmacological intervention. Pregnancy and neonatal outcomes are known to be negatively impacted by overt diabetes mellitus. However, controversies exist regarding adverse effects of GDM due to the use of different criteria used by different studies and various confounding factors in these studies.[4]

The baseline characteristics of women with gestational diabetes mellitus (GDM) and those without GDM were comparable with respect to age and body mass index. The mean age was 28.6 ± 4.2 years in the GDM group and 28.4 ± 4.5 years in the non-GDM group (p = 0.94), while the mean BMI was 25.8 ± 4.9 kg/m² and 25.3 ± 5.1 kg/m², respectively (p = 0.71). Religious distribution was similar in both groups, with Hindus constituting the majority (62.5% in GDM vs. 58.3% in non-GDM; p = 0.82). A statistically significant difference was observed in socioeconomic status, with a higher proportion of women from the middle socioeconomic class in the GDM group (62.5%) compared to the non-GDM group (45.8%), while lower socioeconomic status was more common in the non-GDM group (37.5% vs. 20.8%; p = 0.02). Additionally, a positive family history of diabetes mellitus was significantly more frequent among GDM patients (25.0%) than non-GDM patients (10.4%), indicating a strong familial predisposition (p = 0.04).The current study indicated that the incidence of GDM was 5.72%, which was less than the 13% reported by Nair et al.[8] from Bengaluru, Pune, and Kolkata, and comparable to 7.17% by Rajput et al.[9] from Rohtak, Haryana and higher than that of 3.8% by Zargar et al.[10] from Kashmir. However, Seshiahet al.[8] According to a study, the prevalence of GDM in Tamil Nadu is quite high, at 17.8% in urban areas, 13.8% in semiurban areas, and 9.9% in rural areas. GDM was shown to be higher in medium and upper socioeconomic classes in the current study, however Rajput et al.[9]found that low socioeconomic class had a higher occurrence. In the current investigation, GDM cases had a considerably greater family history of diabetes than controls. Nair et al. found similar outcomes.[8]

Antenatal complications were observed more frequently among women with gestational diabetes mellitus. Urinary tract infection was noted in 16.7% of GDM patients compared to 8.3% of non-GDM patients, although this difference was not statistically significant (p = 0.23). Gestational hypertension and preeclampsia occurred significantly more often in the GDM group (20.8%) than in the non-GDM group (8.3%), showing a statistically significant association (p = 0.04). Polyhydramnios was observed exclusively among GDM patients (6.3%), while no cases were reported in the non-GDM group; however, this difference did not reach statistical significance (p = 0.08). Although the difference was not statistically significant (p = 0.40), vaginal candidiasis was more common in the GDM group (8.3%) than in the non-GDM group (4.2%). Prenatal problems, including preeclampsia and gestational hypertension, were considerably more common in the current study than in the controls. The outcomes are comparable to those of Nair et al.[8] Preterm delivery was significantly more common among women with gestational diabetes mellitus, occurring in 7 patients (14.6%) compared to 3 patients (6.3%) in the non-GDM group (p = 0.04). With respect to the mode of delivery, vaginal delivery was observed in 45.8% of GDM patients and 54.2% of non-GDM patients, while caesarean section rates were higher in the GDM group (50.0%) compared to the non-GDM group (41.7%); however, this difference was not statistically significant (p = 0.29). Instrumental delivery was required in 4.2% of patients in both groups. Postpartum complications were similar in both groups: postpartum sepsis was reported in one patient (2.1%) in each group (p = 1.00), and postpartum hemorrhage occurred in 4.2% of GDM patients and 2.1% of non-GDM patients (p = 0.55). The HAPO study also found that there was no discernible difference in the mode of birth (instrumental versus cesarean) between GDM and controls.[6] and Nair et al.[8]

Neonatal outcomes differed significantly between the two groups. The mean birth weight of neonates born to mothers with gestational diabetes mellitus was significantly higher (2860.4 ± 360.2 g) compared to those born to non-GDM mothers (2705.6 ± 340.8 g; p = 0.04). Apgar scores at 1 minute (8.1 ± 1.3 vs. 8.0 ± 0.9; p = 0.95) and at 5 minutes (8.6 ± 1.4 vs. 8.7 ± 0.8; p = 0.36) were comparable between the two groups.

With regard to birth weight distribution, large-for-dates neonates were significantly more common in the GDM group (29.2%) compared to the non-GDM group (18.8%), while small-for-dates neonates were more frequently observed in the non-GDM group (18.8% vs. 4.2%), and this difference was statistically significant (p = 0.03). Neonatal hypoglycaemia occurred significantly more often among infants of GDM mothers (20.8%) than those of non-GDM mothers (10.4%; p = 0.04). Thevarajah A t al [11]Neonatal hypoglycemia (capillary glucose levels < 1.8 mmol/l) and hyperbilirubinemia (total serum bilirubin levels beyond age-appropriate limits for phototherapy) were the primary outcomes assessed. Multivariable logistic regression was used to generate the adjusted odds ratios [95% confidence interval (CI)]. The GDM group had higher rates of congenital abnormalities, respiratory distress syndrome, and hyperbilirubinemia, although these differences were not statistically significant.Large-for-date babies, birth weight, and neonatal hypoglycemia were among the parameters that Kwik et al. found to have slightly increased in GDM patients. However, most other parameters, such as mode of delivery, neonate Apgar, and instrumental deliveries, were similar in the two groups because BSs were adequately controlled by diet control, insulin, and oral hypoglycemic medications. Kwik et al. made a similar observation.[12] similar study Gasim T et al 13[2014 Pre-eclampsia (p<0.0001), preterm delivery (p=0.0226), induction of labor (p<0.0001), cesarean section (p=0.0019), large for gestational age infants (p=0.0011), macrosomia (p=0.0186), and admission to the neonatal intensive care unit (p=0.0003) were all significantly more common among patients with GDM.

Conclusion

In this study, gestational diabetes mellitus (GDM) was associated with increased maternal and perinatal complications. Women with GDM had a higher incidence of gestational hypertension and preeclampsia (20.8% vs. 8.3%; p = 0.04) and experienced more preterm deliveries (14.6% vs. 6.3%; p = 0.04) compared to non-GDM women. Neonates of GDM mothers had significantly higher birth weights (2860.4 ± 360.2 g vs. 2705.6 ± 340.8 g; p = 0.04) and a greater risk of hypoglycaemia (20.8% vs. 10.4%; p = 0.04). Most GDM cases were effectively managed with diet alone. Early detection and appropriate management are crucial to reduce maternal and neonatal morbidity in GDM pregnancies.

References

1. World Health Organization. The global burden of disease 2000. Geneva: World Health Organization; 2006. Available from: https://www.who.int/
2. DjomhouM,SobngwiE,NoubiapJJ,EssoumaM,NanaP, FomuluNJ,et al. Maternal hyperglycemia during labor and related immediatepost-partum maternal and perinatal outcomes at the Yaoundé CentralHospital, Cameroon. J Health PopulNutr2016;35:28
3. U.S.PreventiveServicesTaskForce.Screeningforgestati onaldiabetesmellitus: U.S. Preventive Services Task Force recommendationstatement. Ann Intern Med 2008;148:759-65
4. Weinert LS. International Association of Diabetes and PregnancyStudy Groups recommendations on the diagnosis and classification ofhyperglycemiainpregnancy:CommenttotheInternatio nalAssociationof Diabetes and Pregnancy Study Groups Consensus Panel. DiabetesCare2010;33:e97
5. HAPO Study Cooperative Research Group, Metzger BE, Lowe LP,DyerAR,TrimbleER, Chaovarindr U, et al. Hyperglycemia and adversepregnancy outcomes. N

Engl J Med 2008;358:1991-2002.
6. HAPO Study Cooperative Research Group. Hyperglycemia andAdversePregnancy Outcome (HAPO) Study: Associations with neonatalanthropometrics. Diabetes 2009;58:453-9.
7. Seshiah V, Sahay BK, Das AK, Shah S, Banerjee S, Rao PV, et al.Gestational diabetes mellitus – Indian guidelines. J Indian Med Assoc2009;107:799-802,804-6.
8. NairVG,SandhuGS,BiswasM,BhallaR.Evaluationofthe incidenceand outcome of gestational diabetes mellitus using the currentinternational consensus guidelines for diagnosing hyperglycaemia inpregnancy. Int J Reprod Contracept ObstetGynecol2016;5:3361-6
9. Rajput R, Yadav Y, Nanda S, Rajput M. Prevalence of gestational diabetes mellitus & associated risk factors at a tertiary care hospital inHaryana. Indian J Med Res 2013;137:728-33
10. ZargarAH, Sheikh MI, Bashir MI, Masoodi SR, Laway BA, WaniAI,et al. Prevalence of gestational diabetes mellitus in Kashmiri womenfromtheIndiansubcontinent.DiabetesResClinPract2004;66:139-45
11. Thevarajah A, Simmons D. Risk factors and outcomes for neonatal hypoglycaemia and neonatal hyperbilirubinaemia in pregnancies complicated by gestational diabetes mellitus: a single centre retrospective 3-year review. Diabetic Medicine. 2019 Sep;36(9):1109-17.
12. Kwik M, Seeho SK, Smith C, McElduff A, Morris JM. Outcomes ofpregnancies affected by impaired glucose tolerance. Diabetes Res ClinPract2007;77:263-8
13. Gasim T. Gestational diabetes mellitus: maternal and perinatal outcomes in 220 Saudi women. Oman medical journal. 2012 Mar;27(2):140.