International Journal of Research in Medical Sciences
Akter H et al. Int J Res Med Sci. 2023 May;11(5):1456-1459
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20231023

Original Research Article

Perinatal complications in women with gestational diabetes mellitus

Hafija Akter*, Tamima Akter, Ummay Kulsum, Munira Parveen

Department of Obstetrics and Gynecology, Uttara Adhunik Medical College and Hospital, Dhaka, Bangladesh

Received: 13 March 2023
Accepted: 29 March 2023

***Correspondence:**
Dr. Hafija Akter,
E-mail: drhafija@gmail.com

ABSTRACT

Background: Gestational diabetes mellitus (GDM) is glucose intolerance during pregnancy, with or without remission after pregnancy. It poses risks to the mother and baby, including future maternal diabetes and up to 42.9% perinatal mortality. Proper diagnosis and management can improve outcomes. This study analyzes perinatal complications in women with GDM.
Methods: This cross-sectional study was conducted at the department of obstetrics and gynecology in Uttara Adhunik medical college and hospital, Dhaka, Bangladesh for 1 year; January 2020- December 2020. A total of 50 subjects who were admitted in the hospital and diagnosed with GDM were included in this study. Informed written consent was taken from the study subjects. A pretested interviewer-administered questionnaire was used to obtain information related to the sociodemogic status, level of education, types of profession, and medical history. A descriptive analysis was done. Data processing and analysis were done by using SPSS version 17.
Results: Most subjects (35, 70%) belonged to the <25 years age group followed by (15, 30%) ≥25 years age group. Among the respondents, most (30, 60%) reside in rural areas of Bangladesh followed by (20, 40%) in urban areas. Regarding socioeconomic status, most of the subjects (25, 50%) came from a low socioeconomic condition, followed by (20, 40%) from middle socioeconomic status, and only 5 (10%) patients came from a high socioeconomic condition. Among all the diagnosed GDM cases, the majority of perinatal complications was macrosomia (14%), followed by neonatal respiratory distress (12%), newborn polycythemia (6%), preterm birth (4%), stillbirth (2%) and congenital malformation (2%). Regarding maternal and placental complications, gestational hypertension was the most common (14, 28%), followed by vaginal candidiasis (12, 24%), premature rupture of membrane (9, 18%), and abruptio placenta (6, 12%).
Conclusions: This study concluded that the most common perinatal complication was macrosomia, followed by neonatal respiratory distress, newborn polycythemia, preterm birth, stillbirth, and congenital malformation.

Keywords: Macrosomia, Polycythemia, Stillbirth, Congenital malformation

INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as glucose intolerance of various degrees that is first detected during pregnancy. For more than a century, it has been known that diabetes antedating pregnancy can have severe adverse effects on fetal and neonatal outcomes. As early as the 1940s, it was recognized that women who developed diabetes years after pregnancy had experienced abnormally high fetal and neonatal mortality.[1] Maternal overweight and obesity, later age at childbearing, previous history of GDM, family history of type 2 diabetes mellitus, and ethnicity are major GDM risk factors. Diagnosis is usually performed using an oral glucose tolerance test (OGTT), although a non-fasting, glucose challenge test (GCT) is used in some parts of the world to screen women for those requiring a full OGTT.[2] Risk assessment for GDM should be undertaken at the first prenatal visit. Women with clinical characteristics consistent with a high risk of GDM (marked obesity, personal history of GDM, glycosuria, or a strong family

history of diabetes) should undergo glucose testing (see below) as soon as feasible. If they are found not to have GDM at that initial screening, they should be retested between 24 and 28 weeks of gestation.[3] Hyperglycemia is associated with a well-documented range of adverse pregnancy outcomes for the mother and fetus.4 According to a study, high birth weight (HBW) infants were more likely to be born to women with GDM than to women without GDM. Finally, women with GDM were over twice as likely to undergo cesarean birth (RR=2.30, 95% CI=1.99-2.65).[5] A study revealed, the GDM group had a higher incidence of complications, including macrosomia, hypoglycemia, hyperbilirubinemia, hypocalcemia, polycythemia, and major congenital anomalies ($p<0.05$). Although our GDM patients were stringently managed with diet or diet plus insulin, as indicated, and maintained almost euglycemic values, these neonatal complications could not be eliminated.[6] Even the mild form of GDM seems to have significant consequences for women and their offspring and is recommended to be aggressively treated. Evidence suggests that early diagnosis and strict control of blood sugar levels throughout the pregnancy can significantly reduce maternal and fetal complications.[7] In a study, the average percentage incidence of 33 possible perinatal morbidities was 41% higher in gestational diabetic pregnancies by the modified criteria. The cumulative number of morbidities was higher in both modified and recommended criteria groups ($p<0.01$ in both instances). In contrast, subjects having a positive glucose screening test but a negative glucose tolerance test by modified criteria had none of the characteristics of gestational diabetes with the single exception of greater age.[8] This study aimed to analyze the perinatal complications in women with GDM.

Objective

General objective

General objective was to analyze the perinatal complications in women with GDM.

Specific objective

Specific objective was to see the demography of the patients with GDM, to know the more common trimester of development of GDM and to see maternal and placental complications.

METHODS

This cross-sectional study was conducted at the Department of Obstetrics and Gynecology in Uttara Adhunik Medical College and Hospital, Dhaka, Bangladesh for 1 year; January 2020 to December 2020. A total of 50 subjects who were admitted to the hospital and diagnosed with GDM were included in this study. Informed written consent was taken from the study subjects. A pretested interviewer-administered questionnaire was used to obtain information related to sociodemohic status, level of education, types of profession, and medical history. A descriptive analysis was done. Data processing and analysis were done by using SPSS version 17. Ethical clearance was obtained from Bangladesh Medical College.

Inclusion criteria

Women aged 18 years or above, patients who had given consent to participate in the study, pregnant in any trimester and diagnosed GDM women were included.

Exclusion criteria

Patients who did not give consent to participate in study and patients with any chronic disease were excluded.

RESULTS

Most subjects (35, 70%) belonged to the <25 years age group followed by (15, 30%) ≥25 years age group. Among the respondents, most (30,60.0%) reside in rural areas of Bangladesh followed by (20, 40%) in urban areas. Regarding socioeconomic status, most of the subjects (25, 50%) came from a low socioeconomic condition, followed by (20, 40%) from middle socioeconomic status, and only 5 (10%) patients came from a high socioeconomic condition (Table 1).

Table 1: Demographic characteristics of pregnant women with GDM (n=50).

Characteristics	N	Percentages (%)
Age group (years)		
<25	35	70
≥25	15	30
Residence		
Rural	30	60
Urban	20	40
Socioeconomic status		
Low	25	50
Middle	20	40
High	5	10

Table 2: Distribution of respondents according to trimester and development of GDM (n=50).

Trimesters	N	Percentages (%)
1st trimester	34	68
2nd trimester	06	12
3rd trimester	10	20

Most of the pregnant women (34, 68%) developed GDM in their 1sr trimester, followed by 10 (20%) patients in the 3rd trimester and 6 (12%) in the 2nd trimester.

Among all the diagnosed GDM cases, the majority of perinatal complication was macrosomia (14.0%),

followed by neonatal respiratory distress (12.0%), newborn polycythemia (6.0%), preterm birth (4.0%), stillbirth (2.0%) and congenital malformation (2.0%) (Figure 1).

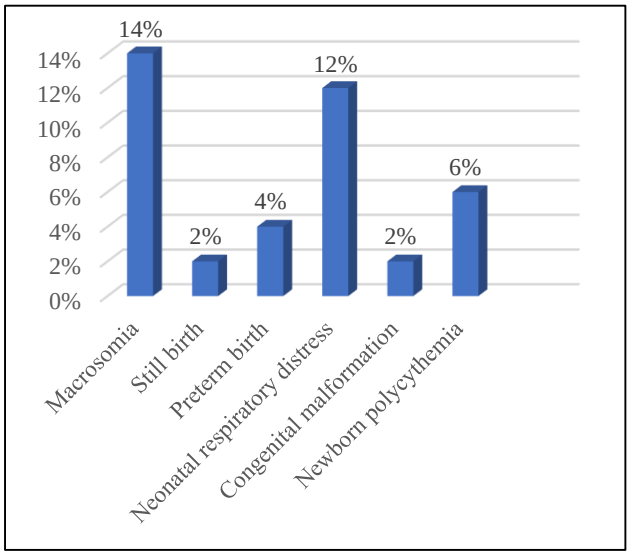

Figure 1: Distribution of subjects according to perinatal complications (n=50).

Table 3: Distribution of subjects according to maternal and placental complications (n=50).

Complications	N	Percentages (%)
Gestational hypertension	14	28.0
Vaginal candidiasis	12	24.0
Abruptio placenta	06	12.0
Premature rupture of membrane	09	18.0

Among the study subjects, gestational hypertension was the most common (14, 28%) associated complication, followed by vaginal candidiasis (12, 24%), premature rupture of membrane (9, 18%), and abruptio placenta (6, 12%) (Table 3).

DISCUSSION

Most subjects (35, 70%) belonged to the <25 years age group followed by (15, 30%) ≥25 years age group. Among the respondents, most (30,60.0%) reside in rural areas of Bangladesh followed by (20, 40%) in urban areas. Regarding socioeconomic status, most of the subjects (25, 50%) came from a low socioeconomic condition, followed by (20, 40%) from middle socioeconomic status, and only 5 (10%) patients came from a high socioeconomic condition which was relatable to another study.[9] Among all the diagnosed GDM cases, the majority of perinatal complications was macrosomia (14%), followed by neonatal respiratory distress (12%), newborn polycythemia (6%), preterm birth (4%), stillbirth (2%) and congenital malformation (2%). According to another study, in the adjusted logistic regression model, the odds of stillbirth in mothers with GDM were 1.8 (95% CI: 1.11, 2.91, p=0.018) times higher than that of the non-diabetics. The odds of macrosomia in diabetic women were about 7 times higher than the non-diabetic women (95% CI: 2.81, 17.14, p<0.001).[10] In another study, in binary logistic regression analysis macrosomia and still were found to have an association with gestational diabetes, COR=11 [95% CI=5.7-21.2] and COR=2.9 [95% CI=1.02-8.5] respectively.[11] Another study stated that mothers with GDM were four times more likely to have a hypertensive disease(p=0.04) and nine times more likely to have vaginal candidiasis (p=0.002). The indications of caesarian section in mothers with GDM were two times more likely to be due to big babies and obstructed labor. The babies of mothers with GDM were more likely to be macrocosmic, stillborn, and have shoulder dystocia than those of normal mothers, which was quite similar to the present study.[13] The incidence of macrosomia and stillbirth were 15.3% and 0.57% respectively. The rates of macrosomia were elevated in mothers with GDM, type 2 DM (T2DM), and rural living according to a study.[14] Another study showed many variables have been associated with fetal overgrowth or macrosomia. Increasingly, maternal pre-gravid weight and decreased pre-gravid insulin sensitivity have been shown to strongly correlate with fetal growth, especially fat mass at birth. Waller et al in 1994 first suggested that the offspring of obese women due to GDM were at increased risk of neural tube defects (OR: 1.8; 95% CI: 1.1-3.0), especially spina bifida. Current evidence suggests that obesity in GDM may be associated with induced preterm delivery, but not spontaneous preterm birth.[15]

Limitations

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

This study concluded that women with GDM are at an increased risk for adverse obstetric and perinatal outcomes. The most common perinatal complication was macrosomia, followed by neonatal respiratory distress, newborn polycythemia, preterm birth, stillbirth, and congenital malformation. Regarding other complications, gestational hypertension was the most common complication, followed by vaginal candidiasis, premature rupture of membrane, and abruptio placenta.

Recommendations

There is growing evidence that GDM significantly increases the risk of several short- and long-term adverse consequences for the fetus and mother. However, there remains a great deal of controversy over when to begin screening for hyperglycemia in pregnancy and at what

level of hyperglycemia should aggressive intervention be initiated. So, further studies should be conducted involving a large sample size and multiple centers in this regard to minimize or prevent the complications of GDM.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Buchanan TA, Xiang AH. Gestational diabetes mellitus. The Journal of clinical investigation. 2005;115(3):485-91.
2. McIntyre HD, Catalano P, Zhang C, Desoye G, Mathiesen ER, Damm P. Gestational diabetes mellitus. Nature reviews Disease primers. 2019;5(1):1-9.
3. American Diabetes Association. Gestational diabetes mellitus. Diabetes care. 2004;27(1):s88-90.
4. Johns EC, Denison FC, Norman JE, Reynolds RM. Gestational diabetes mellitus: mechanisms, treatment, and complications. Trends Endocrinol Metabol. 2018;29(11):743-54.
5. McMahon MJ, Ananth CV, Liston RM. Gestational diabetes mellitus. Risk factors, obstetric complications, and infant outcomes. J Reproduct Med. 1998;43(4):372-8.
6. Hod M, Merlob P, Friedman S, Schoenfeld A, Ovadia J. Gestational diabetes mellitus: a survey of perinatal complications in the 1980s. Diabetes. 1991;40(2):74-8.
7. Gasim T. Gestational diabetes mellitus: maternal and perinatal outcomes in 220 Saudi women. Oman Med J. 2012;27(2):140.
8. Magee MS, Walden CE, Benedetti TJ, Knopp RH. Influence of diagnostic criteria on the incidence of gestational diabetes and perinatal morbidity. JAMA. 1993;269(5):609-15.
9. Begum R, Roy S, Banik S. The prevalence of gestational diabetes mellitus in Bangladesh: a systematic review and meta-analysis. Int J Diabetes Developing Countr. 2022;1-8.
10. Darbandi M, Rezaeian S, Dianatinasab M, Yaghoobi H, Soltani M, Etemad K, et al. Prevalence of gestational diabetes and its association with stillbirth, preterm birth, macrosomia, abortion and cesarean delivery: a national prevalence study of 11 provinces in Iran. J Preventive Med Hygiene. 2021;62(4):E885.
11. Wakwoya EB, Amante TD, Tesema KF. Gestational diabetes mellitus is a risk for macrosomia: case-control study in eastern Ethiopia. BioRxiv. 2018;492355.
12. Odar E, Wandabwa J, Kiondo P. Maternal and fetal outcome of gestational diabetes mellitus in Mulago Hospital, Uganda. African Heal Sci. 2004;4(1):9-14.
13. Aljohani N, Rempel BM, Ludwig S, Morris M, Cheang M, Murray R, et al. Impact of diabetes on maternal-fetal outcomes in Manitoba: Relationship with ethnic and environmental factors. Clin Investigative Med. 2008:E338-45.
14. Yogev Y, Visser GH. Obesity, gestational diabetes and pregnancy outcome. Seminars in Fetal Neonatal Med. 2009;14(2):77-84.

Cite this article as: Akter H, Akter T, Kulsum U, Parveen M. Perinatal complications in women with gestational diabetes mellitus. Int J Res Med Sci 2023;11:1456-9.