Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Obs & Gynae

Maternal and Neonatal Outcomes of Gestational Diabetes Mellitus in a Tertiary Care Hospital in Bangladesh

Dr. Banani Bhowmik[1]*, Dr. Bibha Rani Dey[2], Dr. Bichitra Rani Dey[3], Dr. Suchitra Nath[4], Dr. Madhabi Lata Saha[5]

[1]Junior Consultant (Obs & Gynae), Upazila Health Complex, Ghatail, Tangail, Bangladesh
[2]Subspecialty Trainee (Reproductive Endocrinology and Infertility) OSD, ShSMCH, Dhaka, Bangladesh
[3]Anaesthetist, Upazilla Health Complex, Sarishabari, Jamalpur, Bangladesh
[4]Medical Officer, Upazilla Health Complex, Ghatail, Tangail, Bangladesh
[5]Assistant Professor, Gynae and Obstetrics, DNCC COVID-19 Dedicated Hospital Mohakhali, Dhaka, Bangladesh

DOI: https://doi.org/10.36347/sjams.2026.v14i09.003 | **Received:** 03.07.2026 | **Accepted:** 08.09.2026 | **Published:** 14.09.2026

***Corresponding author:** Dr. Banani Bhowmik
Junior Consultant (Obs & Gynae), Upazila Health Complex, Ghatail, Tangail, Bangladesh

Abstract **Original Research Article**

Background: Gestational diabetes mellitus (GDM) is associated with a range of maternal and neonatal complications. Maternal hyperglycaemia may contribute to polyhydramnios, hypertensive disorders and operative delivery, while neonatal consequences may include abnormal birth weight, hypoglycaemia, hyperbilirubinaemia and respiratory morbidity. This study evaluated maternal and neonatal outcomes among women with GDM managed at a tertiary-care hospital in Bangladesh. ***Methods:*** A descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Sir Salimullah Medical College & Mitford Hospital, Dhaka, from April to September 2013. Fifty-two women with GDM were enrolled by purposive sampling. Maternal complications, mode of delivery, birth weight and neonatal complications were recorded and analyzed using frequency and percentage. ***Results:*** Among maternal complications, UTI was most frequent (15.4%), followed by polyhydramnios (11.6%), vulvovaginitis (7.7%) and pre-eclampsia (3.8%). According to the detailed mode-of-delivery table, 88.5% of women underwent caesarean section and 11.5% had vaginal delivery. Normal birth weight was recorded in 80.8% of neonates, while 17.3% were macrosomic and 1.9% had low birth weight. Most neonates (73.1%) had no recorded complication. Hyperbilirubinaemia occurred in 15.4%, hypoglycaemia in 7.7%, IUGR in 1.9% and respiratory distress syndrome in 1.9%. No neonatal death was reported. ***Conclusion:*** Most women with GDM in this study had no recorded major maternal complication, although urinary infection and polyhydramnios were observed. Caesarean delivery was common. Most neonates had normal birth weight and no significant recorded complication, but macrosomia, hyperbilirubinaemia and hypoglycaemia remained clinically relevant outcomes. Careful maternal glycaemic control and neonatal monitoring are important in the management of GDM.

Keywords: Gestational diabetes mellitus; maternal outcome; neonatal outcome; macrosomia; hypoglycaemia; caesarean section; Bangladesh.

INTRODUCTION

Gestational diabetes mellitus is an important metabolic disorder of pregnancy that can influence both maternal and fetal outcomes. [1,2] Maternal hyperglycaemia may increase the risk of obstetric complications, while fetal exposure to increased maternal glucose can result in fetal hyperinsulinaemia and abnormal fetal growth. [4,5]

The consequences of GDM extend across pregnancy, delivery and the neonatal period. Maternal complications described in association with GDM include hypertensive disorders and increased operative intervention. [3,11] Fetal and neonatal consequences may include macrosomia, growth restriction and metabolic disturbances after birth. [7,9]

Macrosomia is particularly important because excessive fetal growth may complicate vaginal delivery and increase the likelihood of operative intervention. [6] Infants born to mothers with GDM may also develop neonatal hypoglycaemia because fetal pancreatic insulin secretion remains elevated after separation from the maternal glucose supply.[9]

Other neonatal complications reported in association with maternal diabetes include jaundice,

respiratory distress and abnormalities of mineral metabolism. [9,10] Maternal glycaemic control is therefore important in reducing the risk of adverse perinatal outcomes.

The mode of delivery is also an important outcome in women with GDM. Maternal metabolic status, fetal growth, obstetric indications and the clinical characteristics of the pregnancy may influence the decision regarding vaginal or caesarean delivery. [19]

The present study was designed specifically to describe the maternal and neonatal outcomes of women with GDM managed at a tertiary-care hospital in Bangladesh.

Objectives

General objective

To assess maternal and neonatal outcomes among women with GDM.

Specific objectives

1. To determine the frequency of maternal complications among women with GDM.
2. To describe the mode of delivery.
3. To assess neonatal birth weight.
4. To determine the frequency and pattern of neonatal complications.
5. To describe the overall short-term neonatal outcome.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Sir Salimullah Medical College & Mitford Hospital, Dhaka, from April to September 2013. The study population comprised patients admitted to the Obstetrics and Gynecology department, and 52 cases of gestational diabetes mellitus (GDM) were selected purposively. Patients with pregestational diabetes mellitus or GDM associated with comorbidities such as hypertension or chronic nephritis were excluded. The outcome variables included patient profile, clinical presentation, management, maternal complications, fetal complications, and maternal and fetal outcomes. Ethical clearance was obtained from the ethical committee, and approval was subsequently sought from BCPS. Verbal informed consent was obtained, and confidentiality and voluntary participation were ensured. Data were collected using a pretested questionnaire and case record form, with each interview and examination taking approximately 20 minutes. Data were edited, coded, computerized, and analyzed using SPSS, while tables, graphs, and charts were prepared using MS Excel.

RESULTS

Table 1: Frequency table showing maternal complications of study subjects (n=52)

Maternal complications	Frequency	Percentage
Polyhydramnios	6	11.6
Pre-eclampsia	2	3.8
Vulvovaginitis	4	7.7
UTI	8	15.4
Nil	32	61.5
Total	**52**	**100**

Most women (61.5%) had no recorded maternal complication. Among the complications, UTI was the most frequent (15.4%), followed by polyhydramnios (11.6%), vulvovaginitis (7.7%) and pre-eclampsia (3.8%).

Table 2: Frequency table showing distribution of study subject as per mode of delivery (n=52)

Mode of delivery	Frequency	Percentage
Vaginal delivery	6	11.5
Caesarean section	46	88.5
Total	**52**	**100**

According to the detailed thesis table, caesarean section was performed in 46 women (88.5%), whereas 6 women (11.5%) had vaginal delivery.

Table 3: Frequency table showing the distribution of study subjects as per family history of DM (n=52)

Family history of DM	Frequency	Percentage
Present	30	57.7
Absent	22	42.3
Total	**52**	**100**

A family history of diabetes mellitus was present in 30 women (57.7%), while 22 (42.3%) had no reported family history.

Table 4: Frequency table showing the birth weight of baby of study subject (n=52)

Birth weight	Frequency	Percentage
Low birth weight (<2.5 kg)	1	1.9
Normal birth weight (2.5–4 kg)	42	80.8
Macrosomic baby (>4 kg)	9	17.3
Total	**52**	**100**

The majority of neonates (80.8%) had normal birth weight. Macrosomia was present in 17.3%, while 1.9% had low birth weight.

Table 5: Frequency table showing neonatal complications of study subject (n=52)

Neonatal complications	Frequency	Percentage
Hypoglycaemia	4	7.7
Hyperbilirubinaemia	8	15.4
IUGR	1	1.9
RDS	1	1.9
Nil	38	73.1
Total	**52**	**100**

Most neonates (73.1%) had no recorded neonatal complication. Hyperbilirubinaemia was the most frequent complication (15.4%), followed by hypoglycaemia (7.7%). IUGR and RDS were each recorded in 1.9%.

DISCUSSION

The present study evaluated maternal and neonatal outcomes among 52 women with GDM managed in a tertiary-care hospital. The findings demonstrate that although most women did not have a recorded major maternal complication, several clinically important maternal and neonatal outcomes were observed.

UTI was the most frequently recorded maternal complication, affecting 15.4% of women. Polyhydramnios occurred in 11.6%, vulvovaginitis in 7.7% and pre-eclampsia in 3.8%. These findings indicate that women with GDM require surveillance not only for glycaemic control but also for obstetric and infectious complications. The thesis similarly identified UTI as the most common maternal complication in the study population.

Polyhydramnios was present in 11.6% of women. Abnormal fetal growth and altered fetal fluid balance may occur in pregnancies complicated by maternal hyperglycaemia. The frequency observed in this study was lower than that reported in some previous populations, although differences in diagnostic criteria, population characteristics and referral patterns may contribute to variation between studies.

Pre-eclampsia was observed in 3.8% of participants. Hypertensive disorders are recognized maternal complications associated with diabetes during pregnancy. [3,11] Although the number of women affected was small in this study, careful blood pressure monitoring remains important in women with GDM.

The detailed results demonstrated a very high rate of caesarean delivery, with 88.5% undergoing caesarean section. The original thesis discussion suggested that the high caesarean rate may be related to the tertiary-level hospital setting and referral of complicated cases.

The thesis text contains an inconsistency in this particular result: the discussion and abstract mention 76.9%, whereas the detailed Table 3.10 reports 46 caesarean deliveries among 52 women, equivalent to 88.5%. For this manuscript, the detailed table has been used as the primary source of the numerical result.

Birth weight was favorable in the majority of neonates. Normal birth weight was observed in 80.8%, whereas 17.3% were macrosomic and 1.9% had low birth weight. The presence of macrosomia in nearly one-fifth of the study population is clinically important because excessive fetal growth is a recognized consequence of maternal hyperglycaemia.[7,8]

Macrosomia can increase the risk of difficult vaginal delivery and operative intervention.[6] Thus, the relatively high frequency of macrosomia in this study may have contributed to obstetric decision-making, although the study design does not permit assessment of whether macrosomia directly caused caesarean delivery.

Neonatal complications were not recorded in 73.1% of infants. Among the recorded complications, hyperbilirubinaemia was the most frequent at 15.4%, followed by hypoglycaemia at 7.7%. IUGR and RDS

were each observed in 1.9%. No neonatal death was reported.

Neonatal hypoglycaemia is a clinically important complication because fetal hyperinsulinaemia may persist after delivery even though the maternal glucose supply has stopped. [9] Therefore, neonates born to mothers with GDM require appropriate postnatal observation and glucose monitoring.

Hyperbilirubinaemia was more frequent than hypoglycaemia in the present study. Neonatal jaundice has been described among infants born to mothers with diabetes. [9,10] However, because the present study was descriptive and did not include a comparison group, it is not possible to establish whether GDM independently increased the risk of hyperbilirubinaemia.

RDS was uncommon, being documented in only one neonate. The original thesis identifies respiratory distress as a possible consequence of maternal hyperglycaemia because of delayed lung maturation and impaired surfactant synthesis.

The absence of neonatal mortality is reassuring, although it should be interpreted cautiously because of the small sample size. Similarly, the high proportion of neonates without recorded complications suggests generally favorable short-term outcomes among the studied women, but the study cannot determine whether these outcomes differ from those in pregnancies without GDM.

The maternal and neonatal findings together indicate the importance of coordinated obstetric and neonatal care. Glycaemic management, assessment of fetal growth, recognition of maternal complications and appropriate neonatal observation are important components of care. [11]

The tertiary-care setting is relevant when interpreting the results. Referral hospitals may receive a greater proportion of complicated pregnancies, which may partly explain the high operative delivery rate. Therefore, the results should not be interpreted as representing the caesarean rate or complication rate among all women with GDM in Bangladesh.

CONCLUSION

In this study of 52 women with GDM, most women had no recorded major maternal complication, although UTI, polyhydramnios, vulvovaginitis and pre-eclampsia were observed. Caesarean delivery was the predominant mode of delivery according to the detailed study table. Most neonates had normal birth weight and no recorded neonatal complication. Nevertheless, macrosomia, hyperbilirubinaemia and hypoglycaemia were important findings. No neonatal death was recorded. These findings emphasize the importance of adequate antenatal surveillance, maternal glycaemic control, assessment of fetal growth, appropriate obstetric planning and careful neonatal monitoring in pregnancies complicated by GDM.

Limitations

The sample size was small, and the study was conducted at a single tertiary-care hospital using purposive sampling. There was no control group, and therefore the study cannot establish whether the observed complications were attributable specifically to GDM. The study also assessed short-term outcomes only and did not include long-term maternal or offspring follow-up.

REFERENCES

1. Metzger BE, Coustan DR. Summary and recommendations of the Fourth International Workshop-Conference on Gestational Diabetes Mellitus. *Diabetes Care*. 1998;21(Suppl 2):B161-B167.
2. Dutta DC. *Textbook of Obstetrics*. 7th ed. 2011.
3. Donovan PJ. Drugs for gestational diabetes. *Australian Prescriber*. 2010;33:141-144.
4. HAPO Study Cooperative Research Group, Metzger BE, Lowe LP, *et al.,*Hyperglycemia and adverse pregnancy outcomes. *N Engl J Med*. 2008.
5. Setji TL, Brown AJ, Feinglos MN. Gestational diabetes mellitus. *Clinical Diabetes*. 2005;23(1):17-24.
6. Kelly L, Evans L, Messenger D. Controversies around gestational diabetes. *Can Fam Physician*. 2005;51(5):688-695.
7. Boney CM, Verma A, Tucker R, Vohr BR. Metabolic syndrome in childhood: association with birth weight, maternal obesity, and gestational diabetes mellitus. *Pediatrics*. 2005;115(3):e290-e296.
8. Hillier TA, Pedula KL, Schmidt MM, *et al.,*Childhood obesity and metabolic imprinting: ongoing effects of maternal hyperglycemia. *Diabetes Care*. 2007;30(9):2287-2292.
9. Jones CW. Gestational diabetes and its impact on the neonate. *Neonatal Network*. 2001;20(6):17-23.
10. Allen VM, Armson BA, Wilson RD, *et al.,*Teratogenicity associated with pre-existing and gestational diabetes. *J Obstet Gynaecol Can*. 2007;29(11):927-944.
11. Kapoor N, Sankaran S, Hyer S, Shehata H. Diabetes in pregnancy: a review of current evidence. *Curr Opin Obstet Gynecol*. 2007;19(6):586-590.
12. Kuhl C. Aetiology of gestational diabetes mellitus. *Baillieres Clin Obstet Gynaecol*. 1991;5(2):279-292.
13. Ramachandran A, Snehalatha C, Shyamala P, *et al.,*Prevalence of diabetes in pregnant women: a study from Southern India. *Diabetes Res Clin Pract*. 1994;25:71-74.

14. Alwan N, Tuffnell DJ, West J. Treatments for gestational diabetes. *Cochrane Database Syst Rev*. 2003;(3):CD003395.
15. Templeton M, Pieris I. Gestational diabetes mellitus in Australia. 2005-06.
16. Marguette GP, Klein VR, Niebyl JR. Efficacy of screening for gestational diabetes. *Am J Perinatol*. 1985;2(1):7-9.
17. Southwick RD, Wigton TR. Screening for gestational diabetes mellitus in adolescent Hispanic American women. *J Reprod Med*. 2000;45(2):31-34.
18. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes Care*. 2006;29(Suppl 1):S43-S48.
19. Jovanovic L, Pettitt DJ. Gestational diabetes mellitus. *JAMA*. 2001;286(20):2516-2518.
20. Stuebe AM, Mantzoros C, Kleinman K, *et al.,* Gestational glucose tolerance and maternal metabolic profile at 3 years postpartum. *Obstet Gynecol*. 2011;118(5):1065-1073.
21. O'Reilly MW, Avalos G, Dennedy MC, O'Sullivan EP, Dunne F. Atlantic DIP: high prevalence of abnormal glucose tolerance postpartum is reduced by breastfeeding in women with prior gestational diabetes mellitus. *Eur J Endocrinol*. 2011;165(6):953-959.
22. Rebarber A, Istwan NB, Russo-Stieglitz K, *et al.,*Increased incidence of gestational diabetes in women receiving prophylactic 17α-hydroxyprogesterone caproate. *Diabetes Care*. 2007;30(9):2277-2280.