

Pregnancy outcome in women with gestational diabetes mellitus – a study from Eastern India

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Abstract

Introduction: Hyperglycemia first detected in pregnancy during screening test (often between 24-28 weeks) which does not meet the criteria for overt diabetes is called gestational diabetes mellitus (GDM). The International Association of Diabetes in Pregnancy Study group (IADPSG) recommended a new diagnostic criteria and protocol.

Objective: To find out the prevalence, the need for insulin therapy, any short term maternal or fetal adverse effect of metformin therapy and maternal and fetal outcome of gestational diabetes mellitus in eastern part of India.

Methods: This observational study was conducted in a tertiary care semi urban private hospital from October 2018 to September 2019 for a period of twelve months. All women with normal fasting blood sugar at booking underwent oral glucose tolerance test between 24-28 weeks using 75 grams glucose drink. All GDM cases were managed by a multidisciplinary team. Pregnancies complicated with known type 1 or type 2 DM, preexisting hypertension and multiple pregnancies, were excluded from this study. **Results:** Out of 581 total deliveries 70 cases was GDM (12%). All cases received dietary modifications; metformin was needed in 62 (88.5%) and insulin required in 8 (11.5%) cases. 7 cases (10%) detected to have growth between 50th and 90th centile, interestingly 3(4.2%) cases growth was between 5th and 50th centile. 4 patients (5.7. %) delivered between 32 to 34 weeks and 15 (21.4%) between 34-36 weeks. 67 (95.7%) were delivered by caesarean section. There was no perinatal loss. **Conclusion:** This study indicates that majority of the patients with GDM can be managed without insulin. Metformin use has reduced the need for insulin therapy. Universal screening and proper vigilance can result in optimal outcome.

Keywords : Gestational diabetes mellitus, diagnosis, criteria, maternal outcome, neonatal outcome.

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Introduction

Hyperglycemia in pregnancy is one of the common medical problems, particularly in Asian countries.

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It is a broad term which encompasses preexisting type 1, type 2 diabetes mellitus, overt diabetes mellitus first time detected in pregnancy and gestational diabetes mellitus (GDM). Hyperglycemia first detected in pregnancy during screening test (often between 24-28 weeks) which does not meet the criteria for overt diabetes is called GDM [1]. Previously, diagnostic cut-off was validated by future risk of development of type 2 diabetes. Little attention was paid about the perinatal outcome of mild gestational hyperglycemia as it was thought to be not that significant. HAPO study [2]

indicated robust, continuous associations of maternal glucose levels below those diagnostic of diabetes with increased birth weight. It also suggested increased cord-blood serum C-peptide levels. After publication of HAPO study, The International Association of Diabetes in Pregnancy Study group recommended a new diagnostic criteria and protocol. This group suggested universal (not selective in risk group), single – step test (not two step) using 75 gms gram (not 100 grams or 50 grams) glucose load. Any one elevated level (fasting level or one hour level after glucose drink or two hours level) is sufficient to make the diagnosis of GDM [3]. The hyperglycemia and adverse pregnancy outcome follow up study (HYPO FUS) indicated adverse impact of GDM on long-term maternal and infant health [4].

Aims and objectives

To find out the prevalence, the need for insulin therapy, any short term maternal or fetal adverse effect of metformin therapy and maternal and fetal outcome of gestational diabetes mellitus in eastern part of India.

Materials and methods

This observational study was conducted in the department of Obstetrics and Gynecology of a tertiary care semi urban private hospital. The study period was from October 2018 to September 2019 for a period of twelve months. All pregnant women underwent fasting blood sugar test at booking visit. All women with normal report underwent oral glucose tolerance test between 24-28 weeks using 75 grams glucose drink. The IADPSG criteria were followed (fasting – 92 mg/dl, 1- hour – 180 mg/dl, 2-hour- 153 mg/dl). All diagnosed cases of GDM were managed by a multidisciplinary team of obstetricians, diabetologists, dieticians and neonatologists.

Exclusion criteria

- Patients with known Type 1 or type 2 diabetes prior to the current pregnancy.
- Multiple pregnancies.
- Known major fetal anomaly.
- Known hypertension before the current pregnancy.

Ethical permission was waived as this study was undertaken by analyzing the routinely collected data. .

Results

Out of 581 total deliveries 70 cases was GDM (12%). All cases received dietary modifications instituted by specially trained dieticians. Special tailored made diet chart were explained to each patient. Metformin was

needed in 62 patients (88.5%) out of total 70 cases. Dose of metformin was adjusted depending on the follow up blood sugar reports. Insulin was required in 8 (11.5%) cases. Only 7 cases (10%) detected to have fetal growth between 50th and 90th centile. Interestingly in 3(4.2%) cases fetal growth was between 5th and 50th centile (Table 1). 4 cases (5.7. %) delivered between 32 to 34 weeks and 15 (21.4%) between 34-36 weeks (Table 2). 67 patients (95.7%) were delivered by caesarean section. There was no perinatal loss. Four newborn (5.7%) had transient trachypnoea of newborn, 3(4.2%) had hypoglycemia after delivery, another 3(4.2%) had hyperbilirubinemia needing phototherapy. Calculation and analysis were done using Microsoft Excel spreadsheet.

Discussion

The prevalence of GDM varies significantly in different ethnic populations. It is well documented that Asians are more prone to develop GDM and subsequently type 2 DM after few years. According to IDF estimate globally, some form of hyperglycemia occur in one in six of the 20 million annual live births (16.8%). Of this large burden, 16% relate to diabetes in pregnancy (either preexisting type 1 or type 2 DM or diagnosed during pregnancy) and the remaining 84% is GDM. Our prevalence of 12% is very similar to the recently quoted data of International diabetes Federation data [5]. A hospital based study in south India adapted the IADPSG criteria and the prevalence of GDM was found to be 14% [6]. The controversies surrounding whom to screen, when to screen, how to screen and which criteria to follow has been clearly addressed in a recently published special editorial [1]. The IADPSG criteria are now endorsed by World Health Organization, and received endorsement from International federation of Obstetrics and Gynecology [7]. A randomized trial published in 2005, demonstrated that the rate of serious perinatal complications was significantly lower among the infants of the treated group than among the infants in the routine-care group. They concluded that treatment of gestational diabetes reduces serious perinatal morbidity and may also improve the woman's health-related quality of life [8]. Use of oral anti-diabetic pharmacological therapies for treating women with GDM is still controversial. The Cochrane review concluded that the benefits and potential harms of one oral anti-diabetic pharmacological therapy compared with another, or compared with placebo/standard care remains unclear and requires further research [9].

A meta-analysis published in 2019 concluded that metformin could be a safe and effective treatment for GDM. However, they alerted the clinicians to pay attention on the long-term outcomes of offspring with GDM patients treated with metformin. This study also concluded insulin therapy compared with metformin, had a higher increase of neonatal hypoglycemia [10]. Our study also demonstrated that all cases of neonatal hypoglycemia were seen in mothers treated with insulin. The MIG study from New Zealand and Australia in a randomized control trial assigned women with gestational diabetes mellitus at 20 to 33 weeks of gestation to open treatment with metformin, with

insulin if required or insulin. This trial concluded in women with gestational diabetes mellitus, only insulin therapy compared with metformin alone or with additional insulin is not associated with better perinatal outcome. Not surprisingly metformin treatment was preferred to insulin treatment. Compared to other oral hypoglycemic agents, metformin is the preferred one at present time for treatment of GDM [11]. Currently health burden and consequences of GDM in both the mother and the baby, as well as in subsequent generations have been emphasized [12, 13]. Relatively small sample size is one of the limitations of this study.

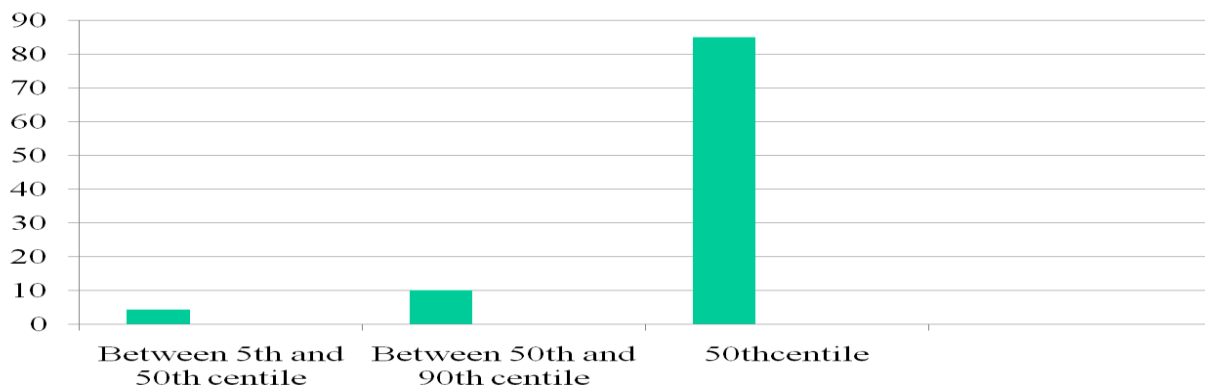


Fig 1: Fetal Growth Chart at 33 weeks period of gestation.

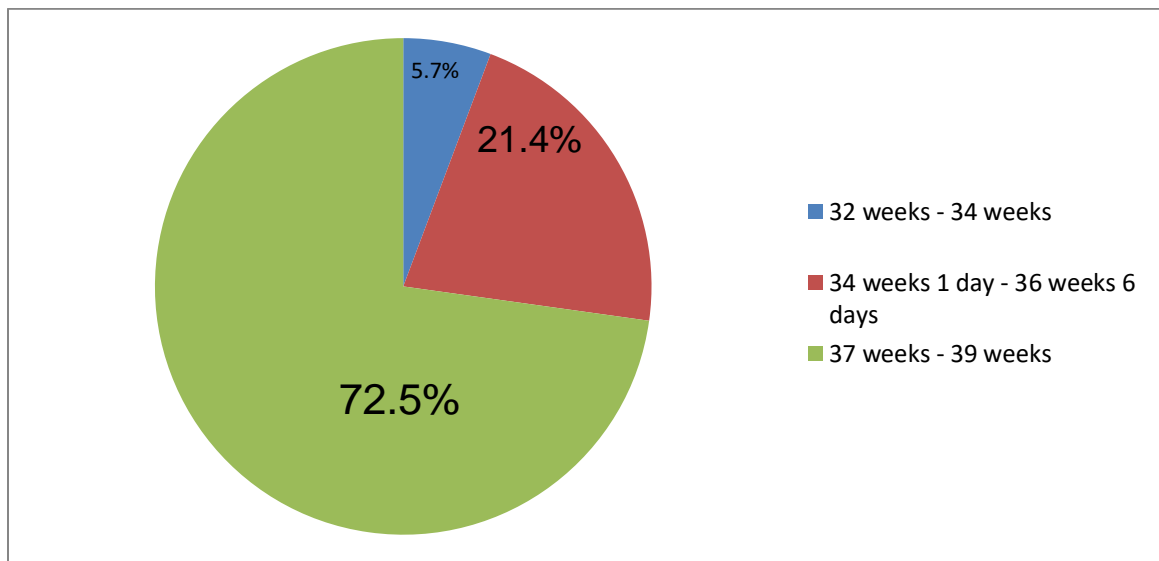


Fig 2: Gestation at delivery (in weeks)

Conclusion

This study indicates IADPSG criteria are robust and acceptable criteria for managing pregnant patients complicating with GDM. This study also suggests that majority of the cases can be managed by dietary modifications and metformin. A relatively small number of patients will need insulin therapy. Good control of blood sugar during pregnancy reduces the chance of fetal macrosomia. Metformin use during pregnancy did not produce any significant fetal or neonatal problem in short term.

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