

Early onset gestational diabetes mellitus: A case report and importance of early screening

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ABSTRACT

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy. Screening for GDM is usually done at 24–28 weeks of gestation. In this case, we report a 31-year-old woman who developed gestational diabetes at 6 weeks in two successive pregnancies. She was in the perceived high-risk group to develop gestational diabetes. The first pregnancy terminated in spontaneous abortion at 10 weeks. In the second pregnancy, institution of insulin therapy at diagnosis was associated with a successful outcome. This case highlights the need of screening for gestational diabetes at the first antenatal visit in the high-risk group.

Keywords: Abortion, antenatal visit, gestational diabetes mellitus, insulin, screening

Introduction

Gestational diabetes mellitus is a heterogeneous medical entity that includes women with pregnancy induced glucose intolerance and women with undiagnosed diabetes discovered during pregnancy.^[1,2] Normal pregnancy is characterised by mild fasting hypoglycaemia, a moderate rise in postprandial plasma glucose, and hyperinsulinemia.^[3] The postprandial hyperglycaemia is due to pregnancy induced physiological insulin resistance which may be due to involvement of hormones-like cortisol, prolactin, progesterone, and human placental lactogen.^[4] GDM is known to be associated with adverse maternal and foetal outcomes like maternal hypertension, caesarean deliveries, development of diabetes, foetal macrosomia, need for neonatal ICU care, etc.^[5] This case points out the need of screening for gestational diabetes early in the pregnancy in the high-risk group which includes women with history of previous GDM.

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Case History

A 31-year-old woman, a housewife, presented to our hospital at six weeks of gestation of her first pregnancy in June 2017. Her body mass index was 23 and blood pressure was 124/78 mm Hg. There was no relevant past medical history. There was a strong family history of type 2 diabetes as both her parents were diabetic. To screen her, a 75 g oral glucose tolerance test (OGTT) was performed. The fasting plasma glucose was 106 mg/dl and 2 h value was 138 mg/dl. Based on the World Health Organisation 1999 criteria, GDM was diagnosed, and necessary dietary advice given.^[1] The pregnancy terminated spontaneously in abortion at 10 weeks. Eight weeks after the abortion, a 75 g OGTT was repeated and this was found to be normal. She was advised to follow a normal diet and to undergo GDM screening as soon as the next pregnancy is detected. She conceived again in February 2018 and underwent a 75 g OGTT at six weeks' gestation. The fasting value was 108 mg/dl and 2-h value was 210 mg/dl. The result of the glycated haemoglobin (HbA_{1c}) testing done at the same time was 6.6% (reference range 6.6–8.3%). The diagnosis of gestational

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DOI:
10.4103/jfmpc.jfmpc_290_19

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How to cite this article: Najmi A, Atal S, Sadasivam B, Singh P, Ray A. Early onset gestational diabetes mellitus: A case report and importance of early screening. J Family Med Prim Care 2019;8:1772-4.

diabetes mellitus was made and insulin therapy in the form of twice daily injections of insulin aspart and once daily injection of insulin lispro was started. Follow ups were done at intervals of 2–4 weeks depending on the glycaemic control achieved. Her average fasting and two hour plasma glucose values were 86 mg/dl and 118 mg/dl, respectively with HbA_{1c} being less than 6.5%. The insulin doses were increased with advancing pregnancy. At the end of the pregnancy, the total daily insulin dose was 60 units. The weight gain during pregnancy was 12 kg. At 38 completed weeks, an elective caesarean section was planned. A live and healthy female baby was delivered weighing 2800 g. The baby had an uncomplicated neonatal course. The patient's plasma glucose values returned to normal by the next morning and insulin injections were stopped. She underwent a 75 g OGTT at six weeks postpartum, which was normal. She was informed of her high risk of developing type 2 diabetes in later life^[2] and was advised to maintain normal body weight by appropriate dietary modifications and regular physical activity. She was also advised to undergo a 75 g OGTT every 3 years.^[2]

Discussion

The mechanism of GDM has not been understood properly till date. The most likely cause is human placental lactogen because of a 1000-fold rise in its level during pregnancy and its homology to the known insulin antagonist, the growth hormone.^[4] As the level of this hormone rises with advancing pregnancy, the insulin resistance worsens with time.^[4] It is at its maximum in the third trimester, necessitating a threefold rise in maternal insulin output to maintain euglycaemia.^[4] Mothers with deficient β cell reserve become glucose intolerant at this time. So, gestational diabetes mellitus typically appears late in the second trimester or early in the third trimester.^[4] Based on this fact, the current recommendation for screening for gestational diabetes mellitus is between 24 and 28 weeks of gestation.^[1,3,6]

According to ADA guidelines 2019, insulin is the preferred medication for pre-existing type 1 and type 2 diabetes not adequately controlled with diet, exercise, and metformin.^[7] For gestational diabetes, insulin is the gold standard. Human insulin, both regular and NPH, and the rapid acting insulin analogues such as lispro and aspart have been licensed for usage in pregnancy. Insulin detemir has been approved for use in pregnancy while glargine is not approved in managing GDM.^[8]

Poorly controlled diabetes both before and during the first trimester of pregnancy can cause major birth defects, spontaneous abortions, and stillbirths.^[9] Despite this well-established fact, more than 60% of women with pre-existing diabetes have difficulty managing their glycaemic control during pregnancy.^[2] Researchers and care providers agree that glycemic control is one of the most important modifiable risk factors in minimizing birth defects of infants born to women with pre-existing diabetes.^[10] While type 1 diabetes management requires insulin and thus leaves little

choice during pregnancy, type 2 diabetes may be managed with life-style modifications, oral anti-diabetic agents, and/or insulin. Among oral agents, several new molecular entities^[11] have been added within the last ten years with limited data on pregnancy outcomes.

Conclusion

Gestational diabetes mellitus screening is usually done at 24–28 weeks of gestation since insulin resistance increases especially during the second trimester and hyperglycaemia occurs in women who do not have the ability to produce enough insulin in response to this blood glucose rise. But this case report shows that GDM screening early in the pregnancy, preferably in the first antenatal visit, and insulin therapy have a definite beneficial role in improving the outcome of the pregnancy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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