



Diagnosis of High-risk Gestational Diabetes Mellitus

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ABSTRACT

Gestational diabetes mellitus (GDM) can be defined as any degree of glucose intolerance with onset or first recognition during pregnancy. Screening for GDM is done usually at 24-28 weeks of gestation. In this case a 27-year-old primigravida who was diagnosed as GDM after a one step approach at 22 weeks of pregnancy. Institution of management early by the help of one step diagnosis was associated with successful outcome. The case highlights the importance of diagnosing GDM early especially in developing countries where resources are limited.

Keywords: Diabetes mellitus; pregnancy-induced; gestational diabetes.

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INTRODUCTION

Approximately 15% percent of all pregnancies are complicated by gestational diabetes mellitus (GDM).¹ Detection should be done during the 24-28 weeks of gestation in which there is threefold rise in maternal insulin output to maintain euglycaemia. Mothers with deficient insulin reserve become glucose intolerant at this time.² There are two diagnostic approaches; one-step approach in which an oral glucose tolerance

test (OGTT) done without prior glucose challenge test and in the next two-step approach we perform glucose challenge test, then measure fasting plasma glucose followed by OGTT to diagnose GDM.³ The one-step approach is done to high-risk pregnant women.

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CASE REPORT

A 27-year-old primigravida female from rural Eastern-Nepal presented to the centre at 24 weeks of gestation according to her last menstrual period, with chief complaints of increased frequency of urination for 10-12 times in a day and increased appetite for last three weeks. She was perceiving good foetal movements. She had strong family history of diabetes mellitus in both her parents. She did not consume alcohol. Her body mass index was 26.9 kg/m² and blood pressure was 128 by 78 mm Hg. To screen her, a 75 grams of OGTT was performed. Her fasting blood glucose was 106 mg/dl and two hours after glucose administration

blood glucose level was 162 mg/dl. Based on World Health Organisation (WHO) criteria as she was a high-risk patient, she was diagnosed with gestational diabetes mellitus.³ This was the first time she approached for medical attention. Basic routine antenatal care (ANC) investigations were conducted and were normal. Ultrasound findings estimated foetal weight of 233 grams. She was admitted with general random blood sugar (GRBS)⁵ profile monitoring per day, daily iron and calcium supplementation and was started on oral hypoglycaemic medication metformin 500 mg per oral twice a day.

Table 1: General random blood sugar profile following admission.

	Fasting	Pre-lunch	Post-lunch	Pre-dinner	Post dinner
1st day of admission	-	-	-	76 mg/dl	186 mg/dl
2nd day of admission	135 mg/dl	82 mg/dl	96 mg/dl	84 mg/dl	126 mg/dl
3rd day of admission	91 mg/dl	107 mg/dl	137 mg/dl	116 mg/dl	126 mg/dl

She was discharged on the third day of admission under oral hypoglycaemic agent and iron calcium supplementation. She was counselled about importance of exercise and diet control. She was also advised to perform foetal surveillance to monitor the growth of the baby. During her follow-up after one week following delivery her fasting blood glucose was 76 mg/dl and two-hour postprandial glucose level was 110 mg/dl, so she was continued in the oral antidiabetic agent. Following the course of pregnancy, total weight gain during the entire pregnancy was 12 kilograms. As she was a high risk GDM on oral hypoglycaemic agent. When she completed 38 weeks of pregnancy elective caesarean section was planned. A live and healthy female baby weighing 2700 grams was delivered. The baby had an uneventful neonatal course. The plasma glucose values returned normal by the next day and oral medication was stopped. She was asked to perform a 75 gram (gm) OGTT at six weeks postpartum and thereafter every three years.³ She was informed about her high risk of developing type 2 diabetes mellitus later and was advised to maintain normal body weight by regular physical activity and appropriate dietary modification.

DISCUSSION

Based on WHO criteria gestational diabetes mellitus should be diagnosed at any time in pregnancy if one or more of the following criteria are met, fasting plasma glucose between 92-135 mg/dl, one hour plasma glucose following a 75 gm oral glucose load more than 180 mg/dl and two hour of plasma glucose following a 75 gm oral glucose load between 153-199 mg/dl. Women with high risk of developing GDM include those who have a history of marked obesity, personal history of GDM, recurrent glycosuria, polycystic ovarian syndrome, and a strong family history of diabetes. They should undergo glucose testing as soon as possible during their ANC visit.^{3,4}

According to American Diabetes Association, the diagnosis of GDM can be done by two approaches:

One-step approach: Perform a diagnostic 75 gm OGTT at 24th-28th week of gestation without prior 50 gm GCT screening. The one-step approach can be applied to high-risk pregnant women of GDM, or all pregnant women not previously diagnosed with overt diabetes in well-conditioned medical institutions.

Two-step approach: Measure FPG (step 1); if FPG ≥ 5.1 mmol/L, GDM can be diagnosed; if 4.4 mmol/L \leq FPG < 5.1 mmol/L, diagnostic 75-g OGTT (step 2) is followed to diagnose GDM or perform an initial screening by measuring the plasma or serum glucose concentration after a 50-g GCT (step 1) and perform a diagnostic OGTT (step 2) on that subset of women exceeding the glucose threshold value on the GCT; if 50 gm GCT ≥ 11.1 mmol/L, FPG is performed to diagnose GDM, if FPG value is normal, 75 gm OGTT should be underwent as soon as possible.

The presence of poorly controlled gestational diabetes mellitus it is associated with increase in risk of birth defects, spontaneous abortion and still births.⁴ This case highlights the importance of early diagnosis and balancing maternal diabetes in preventing adverse foetal outcome. Studies have shown that unbalanced maternal diabetes can lead to foetal macrosomia and hypertrophic cardiomyopathy.⁶ The aim is to maintain blood glucose between fasting 80-90 mg and post prandial is 110-129 mg/dl by dietary lifestyle modification or by hypoglycaemic agents.⁷ Screening for GDM is done between the 24th and 28th week of gestation. Diagnostic standard for GDM is when after 50 gm GCT the plasma glucose level is ≥ 140 mg/dl which is considered as the diagnostic cut-point. The International Association of the Diabetes and Pregnancy Study Groups, American Diabetes Association, International Federation of Gynecology

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