Fasting Blood Sugar, Glucose Challenge Test and One- Two Hour Glucose Tolerance Test in Diagnosis of Gestational Diabetes in Women without Risk Factor

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Abstract

Objective: Gestational diabetes mellitus (GDM) is the most common metabolic disorder during pregnancy. This study aimed to compare the prevalence of GDM positive screening tests with Fasting Blood Sugar (FBS) and Glucose Challenge Test (GCT) in pregnant women without risk factors in Esfarayn, Iran.

Materials and Methods: This descriptive study was conducted on 997 pregnant women, who were referred to the health Center 2 in Esfarayen city in 2014-2015. The sampling method was convenient. It should be noticed that all of pregnant women did not have risk factor of GDM.

Results: 997 pregnant women prenatal care had a fasting glucose test among them, 4 patients had abnormal FBS, While 40 of them after GCT had blood glucose greater than 140 mg and, 20 cases in 1 and 2-hour GCT at the same time had high blood glucose.

Conclusion: Result of our study showed that glucose challenge test for GDM screening is worthwhile, FBS, alone is not useful to screen for GDM

Keywords: Gestational diabetes, Glucose tolerance test, Glucose challenge test, Fasting blood sugar

Introduction

Gestational diabetes mellitus (GDM) can causes different disorders in fetus growth, such as congenital heart disease (1). The prevalence of GDM was reported in 2005 up to 14% worldwide (2). The prevalence of GDM in Iran was reported 9% in 2008 (3). The diagnosis of GDM is very important because diabetes is one of the most common complications of pregnancy that can lead to fetal mortality and an increased risk of maternal diabetes after pregnancy (4,5). Nowadays, after several years of discovering the importance of gestational diabetes, there is still no agreed diagnostic method (6), the oral 50 gram glucose test is introduced as a gold standard test for screening of GDM (7,8).

GDM diagnosis at 24-22 weeks of pregnancy is done with Glucose challenge test (GCT) and giving 50 gram of glucose to a pregnant woman (without the need for fasting) and

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blood glucose measurement one hour later is done ,then if there was glucose concentration more than 142 mg/ dl , three hour glucose tolerance test with 100 grams or 75 grams of glucose is performed (9). If glucose concentration in 2 or more cases were abnormal in a three hour test, or one case of a two-hour test, the pregnant women considered patient and should be treated by a diet or insulin (5,10). Because there is normal fasting blood sugar (FBS) in some pregnant women with GDM, this study aimed to compare the prevalence of GDM positive screening tests with FBS and GCT in pregnant women without risk factors of GDM in Esfarayn, Iran.

Materials and Methods

In this descriptive study was conducted on 997 pregnant women, who were referred to the health Center 2 in Esfarayen city in 2014-2015. In this study the sampling was conducted according convenient method. It should be noticed that all of pregnant women did not have risk factor of GDM.

GCT was performed in all women referred to the Esfarayen county health center for prenatal care during the 24-28th week of pregnancy. In this way, 50 grams of glucose was prescribed to pregnant women (without the need for fasting) and one hour later blood glucose levels were measured, the GTT of 3 hours was then performed in pregnant women whose GCT was above 130 mg / dl. In the GTT, FBs was first measured and after eating 75 grams of glucose, 1 and 2 hours later, blood glucose was measured. Data were analyzed via Chi-Square and by spss-16.

The present study was approved by the Ethics and Research Committee of Esfarayen University of Medical Sciences, Esfarayen, Iran. (code: IR. ESFARAYENUMS. REC. 1396.41).

Results

The results showed that among 997 studied samples, 4 (0.4%) had FBS above 120 mg / dl and 40 (4.2%) had more than 140 mg / dl glucose after eating 50 grams of glucose powder. In the 1 and 2 hour test 20 (2 %) of pregnant women, in the 1 hour test 16 (1.6 %) and in the 2-hour test 4 (0.4 %) of pregnant women had abnormal tests. There were significant differences between diagnosis tests (*P*-value: 0.001).

Discussion

Oral glucose test of 50 g has been somewhat introduced as a gold standard test for screening for GDM (12).To diagnosis of GDM, at 24-22 weeks of pregnancy, screening with GCT 2 and giving 50 g of glucose to a pregnant woman (without the need for fasting) and blood glucose measurement one hour later is done (13). The prevalence of GDM in Iran varies from 1 to 14 percent this difference can be related to methods of diagnosis of diabetes in pregnant women, race, and other factors (3,4,14). In the study of Ferrara and et al, incidence of postpartum screening had increased from 20.7% to 53.8% (15). Keshavarz and et al showed that the incidence of GDM was 4.8% (16). In Iran, in the study of Khoshniat, the prevalence of GDM in pregnant women without GDM risk factors in Tehran was reported 4.4% (3) and also in the Pedersen study in Greenland, the prevalence of GDM was 4.3% (17), which is according to the results of our study. Of course, in the study of Larijani and et al, glucose tolerance disorder in different regions of Iran, was reported about1.3% and 10% (18,19).

Pregnancy is an important situation in which some disease can treat the mother and infant (20,21). So we should examine pregnant women in the different trimesters by diagnostic tests. In the number of studies, there are reports that only pregnant women with high FBS levels have been considered as subjects in the glucose tolerance test, but this study suggests that all pregnant women should test GCT and after this test people can be considered as GDM.

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