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Original research article

Glucose intolerance in pregnant women in Kakinada District, Andhra Pradesh, India

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Abstract

Glucose intolerance during pregnancy predisposes the offspring for increased risk of developing glucose intolerance in the future. This vicious cycle is likely to influence and perpetuate the incidence and prevalence of glucose intolerance in any population. No data is available about the prevalence of glucose intolerance during pregnancy in our district, Andhra Pradesh, India and hence a study was undertaken on this aspect. Diagnosis is based on a 2hr 75 gm OGTT. GDM is diagnosed if either Fasting plasma glucose is more than 126 mg/dl or 2 hr plasma glucose more than 140 mg/dl. This study was performed in the antenatal clinics of Government General Hospital, Rangaraya Medical College, Kakinada and CHC Pedapudi of Andhra Pradesh, India. All the pregnant women attending the antenatal clinic for their regular antenatal check-up were screened for gestational diabetes. As a pregnant woman checks into the antenatal clinic, she was advised to get her random blood sugar tested. All the women who were found to have either an RBS near to the upper cut off limit for the normal or any of the classical risk factors for developing gestational diabetes and were advised to get their FBS and PPBS checked were advised to undergo 2hr 75 gm OGTT. Diagnosis was based on the WHO criteria for gestational diabetes mellitus. Among the 600 pregnant women who had got their random blood sugar checked, 278 [46.3%] women were found to have either an RBS near to the upper cut off limit for the normal or any of the classical risk factors for developing gestational diabetes and were advised to get their FBS and PPBS checked. And upon 2hr 75 gm OGTT, 38 [16.8%] women were diagnosed as GDM, taking both FBS ≥126 mg/dl and/or 2 hr PPBS ≥140 mg/dl as cut-off values. Taking only 2 hour blood sugar for analysis, 35 [15.4 %] had a value ≥140 mg/dl. This study has documented the increased prevalence of GDM in our population necessitating universal screening for glucose intolerance in pregnancy. Using 2 hr plasma glucose 140 mg/dl or above as a one step procedure is simple and economical, particularly for the countries ethnically more prone to high prevalence of diabetes.

Keywords: Glucose intolerance, pregnant women in Kakinada

1. Introduction

Glucose intolerance during pregnancy predisposes the offspring for increased risk of developing glucose intolerance in the future. This vicious cycle is likely to influence and perpetuate the incidence and prevalence of glucose intolerance in any population. No data is available about the prevalence of glucose intolerance during pregnancy in our Kakinada district, Andhra Pradesh, India and hence a study was undertaken on this aspect to study physiological and pathological variations of glucose intolerance during pregnancy.

2. Material And Methods

The study was performed in the antenatal clinics of the government general hospital, Rangaraya Medical College, Kakinada and Community Health Centre Pedapudi, Andhra Pradesh.

All the pregnant women attending the antenatal clinic for their regular antenatal check-up were screened for gestational diabetes. As a pregnant woman checks into the antenatal clinic, she was advised to get her random blood sugar tested. All the women who were found to have either an RBS near to the upper cut off limit for the normal or any of the classical risk factors for developing gestational diabetes and were advised to get their FBS and PPBS checked were advised to undergo 2hr 75 gm OGTT. Diagnosis was based on the WHO criteria for gestational diabetes mellitus.

A glucose tolerance test is a medical test in which glucose is given and blood samples taken afterward to determine how quickly it is cleared from the blood. The test is usually used to test for diabetes, insulin resistance, and sometimes reactive hypoglycemia and acromegaly, or rarer disorders of carbohydrate metabolism. In the most commonly performed version of the test, an oral glucose tolerance test (OGTT), a standard dose of glucose is ingested by mouth and blood levels are checked two hours later.

The patient is instructed not to restrict carbohydrate intake in the days or weeks before the test. The test

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should not be done during an illness, as results may not reflect the patient's glucose metabolism when healthy. A full adult dose should not be given to a person weighing less than 43 kg (94 lb), or exaggerated glucoses may produce a false positive result. Usually the OGTT is performed in the morning as glucose tolerance can exhibit a diurnal rhythm with a significant decrease in the afternoon. The patient is instructed to fast (water is allowed) for 8-12 hours prior to the tests.

Procedure

1. A zero time (baseline) blood sample is drawn.
2. The patient is then given a measured dose of glucose solution to drink within a 5 minute

Diagnosis is based on a 2hr 75 gm OGTT. GDM is diagnosed if either Fasting plasma glucose is more than 126 mg/dl or 2 hr plasma glucose more than 140 mg/dl.

Diabetes Diagnostic Criteria			
Condition	**2 hour glucose**	**Fasting glucose**	**HbA1c**
	mmol/l(mg/dl)	**mmol/l(mg/dl)**	**%**
Normal	<7.8 (<140)	<6.1 (<110)	<6.0
Impaired fasting glycaemia	<7.8 (<140)	≥ 6.1(≥110) & <7.0(<126)	6.0-6.4
Impaired glucose tolerance	≥7.8 (≥140)	<7.0 (<126)	6.0-6.4
Diabetes mellitus	≥11.1 (≥200)	≥7.0 (≥126)	≥6.5

Categorizing Abnormal Glucose Tolerance in Pregnancy

2 hr plasma Glucose	In Pregnancy	Outside pregnancy
> 200 mg/ dl	Diabetes	Diabetes
> 140-199 mg/ dl	Gestational Diabetes Mellitus (GDM)	Impaired Glucose Tolerance (IGT)
120-139 mg/ dl	Gestational Glucose Intolerance (GGI)	-
< 120 mg/ dl	Normal	Normal

3. Result (11 Bold)

A total of 600 pregnant women who were the study subjects were advised to get their RBS checked as a part of their routine antenatal check-up. Of these 600 pregnant women, 278 [46.3%] women were found to have either an RBS near to the upper cut off limit for the normal or any of the classical risk factors for developing gestational diabetes and were advised to get their FBS and PPBS checked. Out of these 278, 226[81.3%] women responded for FBS and PPBS. Out of these 226 women, 1woman [2.6%] was found to have FBS ≥ 126 mg/dl.35women [92.2%] were found to have PPBS ≥ 140 mg/dl. And 2 women [5.2%] were found to have both FBS ≥ 126 mg/dl and PPBS ≥ 140 mg/dl Overall, 38 [16.8%] women were diagnosed GDM. The mean age of these pregnant women was 23 ± 4 years. The prevalence proportion increased with age from 16.2% to 29.1% for the age groups 30+ years. The prevalence proportion of GDM increased with gravida from 17.6% in the primigravida to 24.8% for the gravidas ≥ 3.

Discussion

Evidence indicated that the defects are chronic rather than of acute onset. Although studies to date are limited in scope, they uniformly reveal a chronic ß-cell defect that is present before and after pregnancy and accompanied by increasing blood glucose concentration. This hypothesis suggests that when GDM is diagnosed, it includes Some women with pre-existing glucose intolerance that is revealed by routine glucose tolerance screening in pregnancy. The majority of women with GDM eventually develop diabetes after pregnancy. Published reports indicate a nearly linear increase in the cumulative incidence of diabetes during the first 10 years after pregnancy. The risk is similar among all ethnic groups with GDM. Two studies presented reported that new cases of diabetes continue to appear 1-2 decades after GDM. Insulin resistance in GDM is a more chronic form that is present before pregnancy and is exacerbated by the physiological changes that lead to insulin resistance during pregnancy. Thus, most women with GDM have a combination of acquired and chronic insulin resistance and are therefore, as a group, slightly more insulin resistant than normal women during late pregnancy. Phosphorylation of insulin receptor tyrosine results in the transmission of the insulin signal to enable glucose uptake. Some contributory genetic variants may contribute to GDM or its physiological phenotypes (insulin resistance, ß-cell dysfunction), but the studies to date are relatively small, as are the potential genetic contributions. Increased expression and production of cytokines such as TNF-α, interleukin-6, and leptin by placentas from women with GDM could be relevant to the development of exaggerated insulin resistance in pregnancies complicated by GDM

4. Conclusion

In conclusion, my study has documented the increased prevalence of GDM in our population and I

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venture to give the following observations and recommendations. Universal screening for glucose intolerance during pregnancy is essential as Indian women have high prevalence of diabetes and their relative risk of developing GDM is 11.3 times compared to white womeni. Asian women are ethnically more prone to develop glucose intolerance compared to other ethnic groupsii. GDM based on 2hr 75 gm OGTT defined by WHO predicts adverse pregnancy outcome and warrants treatment. iii2hr 75gm post prandial blood sugar ≥ 140mg/dl serves both as screening and diagnostic criteria besides being a simple and economical one step procedure. As the routine screening for glucose intolerance during pregnancy is not done, probably the undiagnosed glucose intolerance that has been occurring in the past has resulted in the increased prevalence of diabetes in India. The timely action taken now in screening all pregnant women for glucose intolerance achieving euglycaemia in them and ensuring adequate nutrition may prevent in all probability, India becoming diabetes capital of the world. More research on physiological undertstanding of glucose metabolism in pregnant women need to be taken up my health care specialists to improve on the preventive and treatment modalities.

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