

Gestational diabetes mellitus is rare in primigravida Pakistani women

Ali Jawa, Farhan Raza, Khola Qamar, Ali Jawad, Javed Akram

Department of Medicine, Jinnah-Allama Iqbal Institute of Diabetes and Endocrinology (JAIDE), Allama Iqbal Medical College, Lahore, Pakistan

ABSTRACT

Background: Gestational diabetes mellitus is a metabolic disorder defined as glucose intolerance with onset or first recognition during pregnancy. Similar to other members of the Asian race, Pakistani women are also considered to be at a high risk for developing gestational diabetes. **Materials and Methods:** In order to better understand whether this heightened risk attributed to race really exists, we conducted a prospective study to assess the glycemic status of primigravida women presenting to our hospital. **Results:** The mean age of 135 subjects enrolled was 22 (16-31), with 21 (16%), 60 (44%), and 54 (40%) subjects in the first, second, and third trimesters of pregnancy, respectively. The mean fasting, 1-hour, and 2-hour plasma glucose levels were 69.9 mg/dL (3.9 mmol/L), 129 mg/dL (7.2 mmol/L), and 103.6 mg/dL (5.76 mmol/L), respectively. Of 135 women, 6 had a blood pressure reading $\geq 140/90$ mm Hg and only one met the criteria for gestational diabetes mellitus. In our study, despite using the newly proposed International Association of Diabetes and Pregnancy Study (IADPS) cut-offs for diagnosis of gestational diabetes, the incidence rate of gestational diabetes mellitus in primigravida was still $<1\%$. **Conclusion:** Larger trials are needed to truly assess the disease burden of gestational diabetes mellitus in Pakistani women.

Key words: Gestational diabetes mellitus, hyperglycemia, International Association of Diabetes and Pregnancy Study Groups, The Hyperglycemia and Adverse Pregnancy Outcome study

INTRODUCTION

Gestational diabetes mellitus is a metabolic disorder defined as glucose intolerance with onset or first recognition during pregnancy.^[1] Overt diabetes mellitus during pregnancy is associated with significantly increased risks of adverse perinatal outcomes. Similar to other members of the Asian race, Pakistani women are also considered to be at a high risk for developing gestational diabetes.^[2]

In order to better understand whether this heightened risk attributed to racial basis indeed exists, we conducted

a prospective study to assess the glycemic status of primigravida women presenting to our hospital.

Definitions

Based on recent recommendations of International Association of Diabetes and Pregnancy Study Groups,^[3] gestational diabetes was defined as at least two out of three elevated serum glucose readings as follows: fasting >92 mg/dL, 1-hour post 75 glucose ingestion >180 mg/dL, and 2-hours post ingestion >153 mg/dL. Impaired fasting glucose was defined as fasting ≥ 92 mg/dL.

MATERIALS AND METHODS

All primigravida women presenting to the outdoor department of Jinnah Hospital were offered enrollment in the study. We excluded subjects with known liver, cardiac, and renal disease. After obtaining informed consent, subjects were interviewed regarding their age, monthly income, number of household members, etc, and their height and weight were measured. Systolic and diastolic

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Corresponding Author: Dr. Ali Jawa, Allama Iqbal Medical College, Jinnah Hospital, Lahore 54550, Pakistan. E-mail: alijawa@gmail.com

blood pressure was recorded with the patients in a sitting position. Subjects were then asked to come for laboratory testing the next day in a fasting state. Blood specimen was collected using aseptic techniques in appropriate tubes and sent to the pathology laboratory for processing. Blood sample was collected for serum glucose levels at baseline as well as at 1 and 2 hours post ingestion of 75 g glucose solution.

RESULTS

The baseline characteristics of 135 enrolled subjects are summarized in Table 1. The mean age was 22 (16-31) with 21 (16%), 60 (44%), and 54 (40%) subjects in the first, second, and third trimester, respectively. All belonged to poor socioeconomic class with high member/household ratio. The mean fasting, 1-hour, and 2-hour plasma glucose levels were 69.9 mg/dL (3.9 mmol/L), 129 mg/dL (7.2 mmol/L), and 103.6 mg/dL (5.7 mmol/L), respectively. Of the 135 women, 6 had a blood pressure reading $\geq 140/90$ mmHg; only one woman met criteria for gestational diabetes mellitus.

Table 1: Baseline characteristics of primigravida subjects enrolled in the study

Number of subjects	135		
Age	22 (16-31)		
Mean (range) years			
Weight	58 (38-92)		
Mean (range) kg			
Mean Height (range) meters	1.55 (1.43-1.72)		
Mean BMI (range)	24 (16-39)		
Number (percentage) of subjects with at least one parent or sibling with history of diabetes?	30/135 (22%)		
Number (percentage) of Subjects belonging from Urban Lahore	128/135 (95%)		
Average (range) monthly income Pakistani Rupees/US Dollars	PKR10270 (2000-35000) USD116 (23-397)		
Average (range) number of family members per household	8 (2-26)		
Number (Percentage) of households living in joint family system	116/135 (85%)		
Subjects in each trimester	First 21 (16%)	Second 60 (44%)	Third 54 (40%)
Number (percentage)			
Mean fasting blood glucose mg/dL (mmol/L)	69.9 (3.9)		
Mean 1-hour post 75 gram oral glucose load blood glucose mg/dL (mmol/L)	129 (7.2)		
Mean 2-hour post 75 gram oral glucose load blood glucose mg/dL (mmol/L)	103.6 (5.7)		
Mean systolic blood pressure mm Hg	113		
Mean diastolic blood pressure mm Hg	72.5		

CONCLUSIONS

Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study by Metzger *et al.* published in 2008 was a turning point in increasing awareness among the healthcare community about hazards of maternal hyperglycemia.^[4] This study triggered the task force of International Association of Diabetes and Pregnancy Study Groups to propose new guidelines for maternal screening for gestational diabetes mellitus. These criteria are stricter and are expected to identify more patients at risk of hyperglycemia.

In our study, despite using the newly proposed cut-offs for diagnosis of gestational diabetes, the incidence rate of gestational diabetes mellitus in primigravida was still $<1\%$. It would make sense that a woman who has conceived for the first time does not seem to have accumulated “enough” risk factors to be predisposed to hyperglycemic states. However, being a high-risk group, we expected a higher incidence rate, especially since a previous study by Akhter *et al.* showed a 3.3% prevalence among Pakistani women.^[5] This finding also seems to be at odds with that of a Saudi study.^[6]

The authors believe that our cohort has several positive attributes that could explain the extremely low incidence rate of gestational diabetes mellitus. First, the average Body Mass Index (BMI) of the subjects was 24, suggesting a normal pre-pregnancy body weight. Pre-gravid BMI is a known predictor of development of gestational diabetes^[7] with far reaching metabolic implications.

Second, the mean age of our cohort was 22 years, with more than half of the enrolled subjects in their first and second trimesters. Advanced maternal age is a well-defined risk factor for development of gestational diabetes mellitus.^[8] Zargar *et al.*^[9] demonstrated 1.7% prevalence of gestational diabetes in subjects belonging to Indian subcontinent and aged less than 25 years. These findings are much in line with low prevalence of gestational diabetes observed in our study.

Third, multiparity is an established risk factor for glucose intolerance and, ultimately, development of gestational diabetes.^[10] All our subjects were primigravid, and hence cannot be compared with similar studies in multiparous subjects.

About 1% of the subjects had a single elevated blood pressure reading. This could be significant and warrants close follow-up. Insulin resistance during pregnancy

can have several manifestations including gestational hypertension and gestational diabetes. These subjects need close postpartum follow-up as well.

Gestational diabetes mellitus is an illness with two victims: mother and child. If we can make efforts to detect gestational diabetes mellitus early, it is possible to prevent complications in both, and thereby improve the quality of life. There is also a dire need for education among healthcare professionals regarding benefits of early management of diabetes and appropriate use of oral glucose tolerance tests for timely diagnosis. Needless to say, larger population based trials are necessary to truly assess the disease burden of gestational diabetes mellitus in Pakistani women.

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