OBSERVATIONS

"Abnormal" Fasting Plasma Glucose During Pregnancy

Gestational diabetes mellitus (GDM) is defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy (1) and is a major medical complication of pregnancy. Untreated, the would-be mother and yet-to-be-born child are likely to suffer morbidity and mortality.

The World Health Organization criterion for diagnosis of GDM is 2-h plasma glucose (PG) ≥140 mg/dl on a 75-g oral glucose tolerance test (2). However, birth weight of the child and cumulative risk of type 2 diabetes both increase with any rise in 2-h PG ≥120 mg/dl (3). Further, data regarding the correlation between maternal fasting PG (FPG) levels and macrosomia are scant. Hence, we analyzed the relationship between the birth weight of neonates and their mothers' FPG within the spectrum of putatively normal 2-h PG limits for this community, that is, between 120 and 139 mg/dl.

After obtaining ethics committee approval, 12,056 consecutive antenatal women were screened in the third trimester, with their informed consent to participate. Their FPG values and 2-h PG values after a 75-g oral glucose load were estimated by the glucose oxidase peroxidase method. The diagnosis of GDM was based on the World Health Organization criterion (2). The primary end point was the occurrence of neonates whose birth weights were >90th percentile and whose mothers' 2-h PG values were between 120 and 139 mg/dl.

To examine the linear trend of the proportion of neonates whose birth weights were >90th percentile across the maternal FPG levels, the χ^2 test was used. Within the group of women who had 2-h PG values between 120 and 139 mg/dl, the FPG values were categorized into four groups: <80, 80–84, 85–89, and ≥90 mg/dl. All P values <0.05 were considered statistically significant.

Among the 12,056 women screened, 1,679 (13.9%) were diagnosed as having GDM. Of the women whose 2-h PG values ranged between 120 and 139 mg/dl, 5,918 were available for follow-up and the remainder were inaccessible because of migration to their maternal place for confinement, which is the prevailing custom of the community. Of those who were available for follow-up, 426 (7.20%) had delivered infants whose birth weights were >90th percentile. The proportion of infants with birth weight >90th percentile increased across the different levels of FPG (<80 mg/dl, 7.1%; 80–84 mg/dl, 9.3%; 85–89 mg/dl, 12.7%; and ≥90 mg/dl, 14.6%), and the trend was statistically significant ($P < 0.01$). A significant increase in birth weight >90th percentile was observed across the spectrum of FPG levels and noticeably in the category of ≥90 mg/dl (adjusted odds ratio 2.08 [95% CI 1.24–3.48], $P = 0.005$).

We observed in this community-based project, which is the largest such project other than the Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study, that occurrence of birth weight >90th percentile increased continuously as maternal FPG increased from 80 mg/dl and that this increase was significant when maternal FPG was >90 mg/dl. Lapolla et al. (4) also found that FPG could predict fetal overgrowth and that FPG >85 mg/dl doubles the risk of incidence of infants large for gestational age. Hence, we suggest that maternal FPG >90 mg/dl may be considered as "abnormal" during pregnancy.

VEERASAMY SESHIAH, MD
VIJAYAM BALAJI, MD
ARUNACHALAM PANNEERSELVAM, MD
MADHURI S. BALAJI, MB

From the Diabetes In Pregnancy—Awareness and Prevention (DIPAP) Project, Dr V Seshiah Diabetes Care and Research Institute, Chennai, Tamil Nadu, India.
Corresponding author: Veerasamy Seshiah, vseshiah@gmail.com.
Received 23 August 2008 and accepted 3 September 2008.
DOI: 10.2337/dc08-1553
© 2008 by the American Diabetes Association. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. See http://creativecommons.org/licenses/by-nc-nd/3.0/ for details.

Acknowledgments— We thank the World Diabetes Foundation and the Ministry of Health, Government of Tamil Nadu, India, for extending their support to carry out this community-based Diabetes in Pregnancy—Awareness and Prevention Project.

References

1. Metzger BE, Organizing Committee: Summary and recommendations of the Third International Workshop—Conference on Gestational Diabetes Mellitus. *Diabetes* 40 (Suppl. 2):197–201, 1991
2. World Health Organization: Prevention of diabetes mellitus. Geneva, World Health Org., 1994 (Tech Rep. Ser., no. 844)
3. Franks PW, Looker HC, Kobes S, Touger L, Tataranni PA, Hanson RL, Knowler WC: Gestational glucose tolerance and risk of type 2 diabetes in young Pima Indian offspring. *Diabetes* 55:460–465, 2006
4. Lapolla A, Dalfrà MG, Bonomo M, Castiglioni MT, Di Cianni G, Masin M, Mion E, Paleari R, Schievano C, Songini M, Tocco G, Volpe L, Mosca A: Can plasma glucose and HbA1c predict fetal growth in mothers with different glucose tolerance levels? *Diabetes Res Clin Pract* 77:465–470, 2007